

HP Professional

JULY 1999

Servers

Workstations

Channels

www.hppro.com

WINDOWS NT

Is NT Clustering A Good Idea?

Find Out
On Page 20



#BXKCDG *****AUTO***** 5-DIGIT 77027
CAROL CALHOUN
BRADMARK TECHNOLOGIES
4265 SAN FELIPE ST/STE 800
HOUSTON, TX 77027-2999

D. HARMS

Outside The Box PAGE 8

Will Only One I/O Spec Be
Left Standing?

HP-UX Admin Man PAGE 32

Correcting A Know-it-all

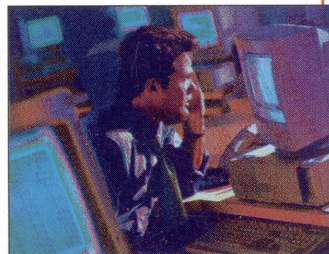
The Net Net PAGE 34

Waiting For WBEM

HP 3000

Special Section

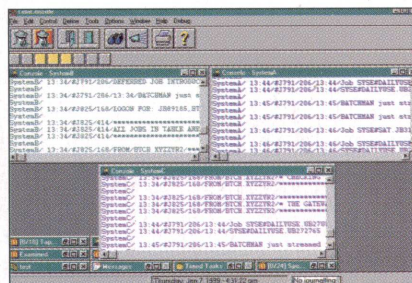
Don't
Change
That
Channel!



TV Guide and \$STDLISTs

Product Watch

Precise Software Solutions'
Precise/Pulse!



The pressure is on to
build and make
the best use of your
Microsoft Windows NT
solutions

Where do you go from here?

You're adding Windows NT® into an IT environment that already includes extensive HP-UX and MPE systems. With limited IT staffing and NT experience, compounded by aggressive deadlines, the challenge to do it all is enormous. That's why it's good to know Hewlett-Packard is here to help you with your Microsoft® service needs.

HP's unique qualifications to build and maintain your Microsoft environment include:

- an alliance with Microsoft that spans more than 10 years
- first worldwide Microsoft Certified Support Center
- first vendor to offer 99.9% uptime commitment for Windows NT
- first vendor to offer HP-UX/Windows NT integration and interoperability training
- first vendor to offer Windows 2000 training

And once you've rolled out your NT environment and applications, the HP OpenView™ family of IT management solutions enables you to keep everything up and running—HP-UX, MPE, and NT alike.

So, whether you're building an enterprisewide Microsoft Exchange Server messaging system, rolling out a mission-critical ERP application, such as SAP® R/3 on NT, applying the latest IT management tools like HP OpenView to manage your NT environment, or planning to migrate from NT to Windows 2000, you can trust HP to deliver the expertise you need.

From planning and design, to solution deployment, to providing the highest quality of ongoing support, HP will back your Microsoft environment end-to-end. And, we'll do it the same way we've backed your HP-UX and MPE environments for the past 25 years: with the industry's leading services.

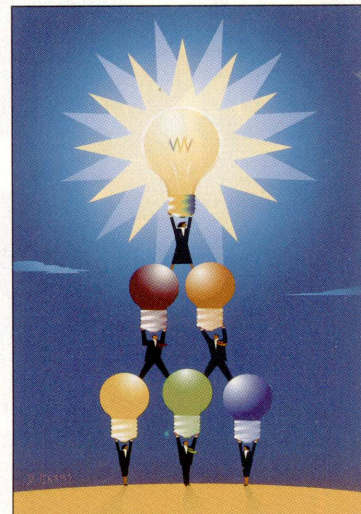
Microsoft
technology
services
From HP

For more information about Microsoft Technology Services from HP, call 877.652.9515 or visit www.hp.com/go/ntsolutions. We'll get you where you want to go.

JULY 1999

HP Professional

Vol. 13 No. 7



WINDOWS NT

16 Planning For A Peaceful Coexistence

You can fight it. Or you can accept it. The big "it," of course, is Windows NT. When establishing a meaningful relationship between UNIX and Windows NT technologies, it pays to ask a lot of questions. **By Chris Wood**

20 Putting Some Luster On NT Clusters

NT servers here. NT servers there. It seems that NT servers are everywhere. So, why not combine them into a single server? **By Ryan Maley**

28 PC Workstations Outflank UNIX Counterparts

The time has finally arrived. The so-called PC workstation has reached parity with its UNIX counterpart. With its P-class, X-class, Kayak and Brio workstations, HP is ready to benefit.

By Ken Deats

WORKSTATIONS

32 HP-UX Admin Man: Know-it-all In A Shell

Working with a know-it-all can sometimes be unpleasant. Fred explains how with a look at the tcsh spell correct feature. **By Fred Mallett**

NETWORK MANAGEMENT

34 The Net Net: The ABCs Of WBEM And XML

In a CIM-ulated world, you can build applications using management data from a variety of sources and different management systems, such as HP OpenView, Microsoft SMS, Tivoli Management software and Compaq Insight Manager. WBEM and XML are here — almost — to help. **By Charles Hebert**

HP 3000 SOLUTIONS

36 TV Guide Dials In Efficiency With Automated Error Detection

With the competition getting tougher everyday, those who are still printing out \$STDLISTs and checking errors/aborts manually, are giving their rivals an edge. **By Phil Anthony**

OUTSIDE THE BOX

8 I/O, I/O IT's Off To The Future We Go

An I/O standards war is heating up between the Next Generation I/O Forum and the Future I/O Alliance. Can you afford to take a wait-and-see attitude until a victor emerges?

PRODUCT WATCH

12 Telamon's TelAlert

14 Precise Software Solutions' Precise/Pulse!

DEPARTMENTS

5 Editorial

44 New Products

46 Marketplace

47 Advertiser Index

48 HP New Products

www.hppro.com

HP® SALES • RENTALS • SERVICE

1-800-422-4872



WORKSTATIONS

B Series
C Series
J Series
Visualize Graphics

BUSINESS SERVERS

E Series
D Series
G - H - I Series
K Series

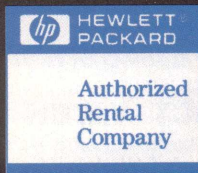
COMPLETE LINE 700 & 800 SERIES IN STOCK!

AND MORE...

Add On Memory
Disc Arrays
Opticals
Netservers

Test & Measurement
Personal Computers
Data Acquisition
Notebooks

X Terminals
Printers
Plotters
Disc-Drives



THE RIGHT EQUIPMENT. RIGHT NOW.



2040 West Sam Houston Parkway N. • Houston, Texas 77043

713/935-1500 • Fax: 713/935-1555 • <http://www.tsa.com> • E-mail: info@tsa.com

BCI's Reader
Service Link
hppro.com

HP PROFESSIONAL EDITORIAL ADVISORY BOARD

Robert Bruen
Computing and Networking Manager at the MIT Lab for Nuclear Science

Thomas Kucharvy
President of Summit Strategies

John R. Logan
Vice President of Aberdeen Group Inc.

Michael J. Meinz
Principal Technical Consultant at General Mills Inc.

Bard F. White
CIO and Worldwide Director of MIS for Spalding Sports Worldwide

Charles T. Herbert
President
Southernview Technologies, Inc.

CORRECTION

In June, we incorrectly reported that Ignite-UX was "previously a \$595 add-on." Ignite-UX, however, has been freely available to HP-UX licensees since 1997. It is also available at www.software.hp.com.

HP Professional

www.hppro.com

EDITOR-IN-CHIEF George A. Thompson
thompsonga@hppro.com
ASSOCIATE EDITOR Kenneth A. Deats
deatska@hppro.com
CONSULTING EDITOR Mark McFadden
mcfadden@21-st-century-texts.com
CONTRIBUTING EDITOR Lane Cooper
washbureau@aol.com

COLUMNISTS

WORKSTATIONS Fred Mallett
frederm@famece.com
SERVERS Ryan Maley
ryan@maley.org
NETWORK MANAGEMENT Charles Hebert
charles@southernview.com
CONTRIBUTING AUTHORS Jeff Dodd,
Stephen Swoyer

EXECUTIVE DESIGN DIRECTOR Leslie A. Caruso
carusola@boucher1.com
ASSOCIATE ART DIRECTOR Jennifer Barlow
barlowja@boucher1.com
PRODUCTION MANAGER William Hallman
hallmanwf@boucher1.com
CIRCULATION DIRECTOR Dianna Schell
schellda@boucher1.com
MARKETING MANAGER Angela Campo
campoam@boucher1.com

IT GROUP PUBLISHER Thomas J. Wilson
wilsonstj@boucher1.com

BOUCHER COMMUNICATIONS, INC.

PRESIDENT AND CHIEF EXECUTIVE OFFICER
Robert N. Boucher

EXECUTIVE VICE PRESIDENT
Thomas J. Wilson

EXECUTIVE VICE PRESIDENT
R. Patricia Herron

VICE PRESIDENT & CHIEF FINANCIAL OFFICER
Andrew D. Landis

DIRECTOR, HUMAN RESOURCES
Mary G. Steigerwalt

SUBSCRIPTION SERVICES

HP PROFESSIONAL ISSN 0896-145X is published monthly by Boucher Communications Inc., 1300 Virginia Dr. Ste. 400, Fort Washington, PA 19034. Subscriptions are complimentary for qualified U.S. and Canadian sites. Periodicals postage paid at Fort Washington, PA 19034, and additional mailing offices.

For address changes and other subscription information in the U.S.: hp@omeda.com or call (800) 306-6332. Outside the U.S., call (847) 291-5212 or fax (847) 564-9002. In the U.S., missed issues must be claimed within 45 days of the publication date; outside the U.S., missed issues must be claimed within 90 days. Editorial, advertising sales and executive offices at 1300 Virginia Dr., Ste. 400, Fort Washington, PA 19034 • tel: (215) 643-8000, fax: (215) 643-8099.

US POSTMASTER: Send all correspondence and address changes to HP PROFESSIONAL, P.O. Box 3053, Northbrook, IL 60065. COPYRIGHT © 1999 by Boucher Communications Inc. CANADIAN POSTMASTER: Send all correspondence and address changes to Boucher Communications, C/O N.L.I., P.O. Box 44, RPO Rockwood Mall, Mississauga, ON L4Z 9Z9.

PERMISSIONS

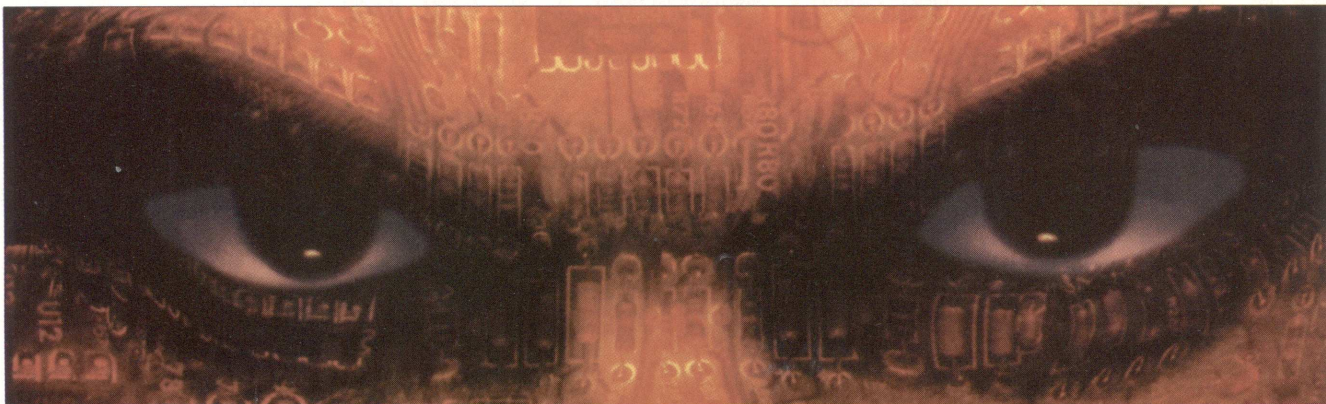
HP Professional, an independent magazine, is not affiliated with the Hewlett-Packard Company. HP and Hewlett-Packard are registered trademarks and HP Professional is a trademark of the Hewlett-Packard Company. Other trademarks and trade names used throughout the publication are the property of their respective owners.

All rights reserved. No part of this publication may be reproduced in any form without written permission from the publisher. All submitted manuscripts, photographs and/or artwork are sent to Boucher Communications Inc. at the sole risk of the sender. Neither Boucher Communications, Inc. nor HP Professional magazine is responsible for any loss or damage.

Canada Post International Publication
Mail Canadian Distribution Sales Agreement #IPM0264431

Printed in U.S.A.





HIBACK & HIBARS

Time for your Mother! We Watch Your Data...™



Do you want to have more time for your mother and still feel secure your enterprise data is always safely backed up? HIBACK & HIBARS, are two leading-edge software tools to help backup and administer your enterprise-wide data.

Whether it's UNIX, NT, MPE or LINUX. Whether it's on a LAN, WAN or SAN. If it's applications or databases. HIBACK & HIBARS will meet the needs of your enterprise for extremely fast and reliable backup and restore. Local or remote, via cable or satellite. You name it!

Your mother gives you unconditional love. HIBACK & HIBARS give you peace of mind.

HIBACK & HIBARS – your mother will like it.

→ See us at HP World, booth 1423

HICOMP America, Inc.
P.O. Box 2959
Spring, TX 77383-2959, USA

Phone: +1 (800) 323-8863
Fax: +1 (281) 355-6879
E-Mail: sales@hicom.com
www.hicom.com

HICOMP Software Systems GmbH
Gründgensstraße 16
D-22309 Hamburg

Tel: +49 (40) 638 09 0
Fax +49 (40) 631 60 04
Mail: info@hicom.de
www.hicom.com

HI • COMP
SOFTWARE SYSTEMS

The Innovators™ in Enterprise
Backup Technology

It's ALL about...

Performance ♦ Reliability

Technology ♦ Teamwork



It's ALL about your success

Systems and Network Management Consulting

Customized Management Applications & Agents Development

On-Site Remote Network Operations Management

Best-in-Class Reseller

inoTechTM
Systems and Network Management

www.inotech.com

1-800-INOTECH

BCI's Reader
Service Link
hpro.com

Day In, Day Out

Presidents have a Day. Saint Patrick has a Day. The American flag has a Day. Laborers have a Day. Mothers and fathers and grandparents have a Day. Then there's a Day for secretaries, valentines and bosses. Now, while waiting with bated breath for Editor's Day, here comes a Day to recognize IS professionals.

In case you missed the e-mails, ties and flowers, (what do you get for the IT professional who has everything?), the day came and went, with little fanfare, on June 21, 1999. Don't blame HP, sponsors of the first-ever — drum-roll, please — National IS Appreciation Day.

The day before the official start of PC Expo, HP corporate execs, Neal Martini, senior VP and GM of HP's Commercial LaserJet Business Unit and Tony DiCairano, area sales manager for the North Atlantic Region, were on hand, along with Michael Miller, editor-in-chief of PC Magazine, Carolyn G. Rose, CEO of HyCurve, Inc., Alan P. Hald, cofounder of MicroAge and Marianne Grogan, president of Intelliquist Information Group, at the Grand Hyatt in New York City to commemorate the event.

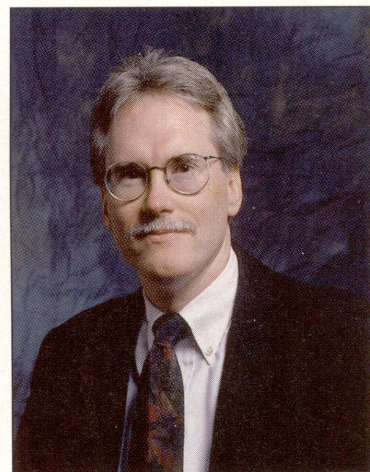
Vice-President, Al Gore, famous Internet inventor, and presidential candidate, sent his warmest and fuzziest wishes in a letter (printed on recycled paper) that read in part, "The entrepreneurial spirit and ethic of hard work and diligence that have driven your success are examples to the world of the values that make America the nation of hope and opportunity for all." And did you take the National Appreciation Day Challenge? Apparently more than 8,500 IS professionals answered the National Appreciation Day Trivia Challenge question: "In what year did HP introduce the first HP LaserJet printer?" But nearly half didn't come up with the answer of 1984. For shame. For shame.

More interesting were several findings presented from the TechnoPulse Survey, a joint undertaking between HP and Intelliquist Information Group (Austin, Texas). More than 75% of IS professionals feel their jobs are essential (31%) or important (46%). However, respondents generally believe that their fellow non-IS professionals underestimate their value, predicting that 30% would say it would be business as usual (7%) or that work efficiency would be slowed only somewhat (23%) if the IS department went on strike. Perhaps an IS Appreciation Day is just the prescription to cure those Information Age Blues.

But I found it more than curious that HP IS Appreciation Day was sponsored by Carolyn Ticknor's LaserJet Imaging Systems, the group responsible for HP's printing, multi-function and imaging products. So I found myself asking, "Where's the Internet Software Business Unit (ISBU) responsible for E-Services? Where are the HP representatives from the HP 3000, HP 9000 and NetServer divisions? Aren't they an important part of the IS Appreciation equation?"

Although well-intentioned, the event seemed to miss the point of HP's own rhetoric which is to "gather IS professionals, technology leaders and market innovators to explore the issues raised by HP's TechnoPulse survey and to evaluate the future of the technology industry." HP's Enterprise Computer Organization (which houses HP servers and software) missed an especially important synergistic moment to present a unified front with their peripheral counterparts. Consequently, HP National IS Appreciation Day, which HP would like to see become an annual occurrence, seemed like nothing more than a shill for HP's very well-known peripheral products.

If the new-all-computer half of Hewlett-Packard (the only half with a name at the moment) wishes to put their compartmentalized and decentralized past behind it, they'll have to work harder at communicating amongst themselves and their disparate divisions to establish a freshly-minted mind share among their most important audience.



Only a day
away?

A handwritten signature in dark ink, reading "George A. Thompson".

George A. Thompson
thompsonga@hpro.com

AutoRAID = peace of mind



Call us sentimental, but we think you've got better things to do than worry about managing data storage. Now, there's HP AutoRAID, the only disk array solution that features new technology that automatically optimizes the speed of RAID 0/1 and the efficiency of RAID 5, without manual tuning. Auto-configuration and online capacity

AutoRAID = hp

upgrades that drastically cut administrative time. And the 99.95% uptime commitment of HP's High Availability solutions, so you can relax. After all, life is short. Wouldn't you rather be having fun? Call your HP representative, or visit www.hp.com/go/autoraid to discover how our new promotions can turn managing storage into a day at the beach.

Visit now, and you might even win a palm-size PC.

www.hp.com/go/autoraid



HEWLETT®
PACKARD

Outside

THE BOX

I n s i d e I T

I/O, I/O IT's Off To The Future We Go

The Next Generation Vs. The Future Alliance

Advancements in distributed applications have exposed weaknesses in traditional I/O standards.

The industry now realizes that PCI can only go so far. PCI is a bus-based standard that forces all I/O processes to share the same bus with a bandwidth of 500MB per second.

KNOW YOUR LIMITS

The soon to emerge evolutionary standard, PCI-X, will push that limit to 1GB per second, using the same form factor and bus architecture as PCI.

The realization of that limit has led to the forma-

tion of two separate and competing organizations that both want to push I/O standards forward. The *Next Generation I/O Forum* (NGIO) was formed primarily by Intel, Sun Microsystems, Dell and Hitachi. Next came the *Future I/O Alliance* formed by HP, IBM, Compaq, 3Com and Adaptec.

"They're fundamentally trying to solve the same issues," says James Gruener, managing director of Windows 2000 platforms at Aberdeen Group (Boston, Mass.). "The big difference will be in their implementations."

Both organizations are promoting a decentralized

approach to I/O where one unit will be predominantly CPUs and another an I/O unit. A switched-fabric architecture will connect the two boxes. "The battle comes down to who controls the box," says Gruener. A switched-based, point-to-point architecture will require manufacturers and ISVs to incorporate different form factors and software models into their products.

"It's a revolutionary step to get revolutionary benefits," says Scott Emo, a technical marketing manager at HP, speaking for the Future I/O Alliance. "We expect to offer two thousand MB per second to start with and it's

designed to double and quadruple that."

BYE BYE PCI

"PCI is not going to meet the need of enterprise class server requirements," says Charles Andres of Sun Microsystems, acting as marketing communications manager for the NGIO. "Because of the latency and slow error detection inherent in PCI, PCI-X won't meet those needs either." Andres adds that NGIO's initial specification should provide 2.5GB per second per channel and will be designed for multiple channels.

"In five to 10 years we'll see requirements in the one terabyte per sec-



D·I·S RESEARCH, LTD.

No Rookies Here

The All Star Team for Enterprise Solutions

We are a seasoned team of certified professionals with the technical and business expertise to address your IT manageability issues, nationwide. We design superior business solutions that meet, and often exceed, our customers' expectations.

Our new **Telecommunications Services Group (TSG)** helps you implement end-to-end telecommunication solutions including planning, administration and technical support of complex communications environments. In addition, we provide hardware/software procurement, warehousing, staging, integration, distribution, installation, technology upgrades, training and call-center maintenance.

Our **Technology Management Group (TMG)** delivers solutions that help you manage the reliability and productivity of your IT investment. We consult and deploy in the areas of operations automation, mission critical computing, network security, desktop management and internet service management.

DIS is a Master Level Best in Class DAR, HP certified in 9000/3000 systems and NT servers. We have extensive experience in managing mixed UNIX/NT/Legacy environments.

**We have the People...the Partners...
the Processes...and the Technology to help you
maximize your resources and
face the IT challenges of the millennium.**



D·I·S RESEARCH, LTD.

1500 Broadway, 31st Floor, NY, NY 10036
Tel: (212) 329-4200 Fax: (212) 329-4100
www.dis-research.com

New York • New Jersey • Georgia • Alabama
Texas • Colorado • California

BCI's Reader
Service Link
hpro.com



ond range. We want to make it scalable – start at low cost and ramp up as requirements demand it,” he adds.

“You have no standards when there are two standards. If I was a customer today, I would sit and wait,” says Gruener. As to the possible industry repercussions of competing standards, Gruener sees the additional costs of maintaining two different R&D efforts translating into “significant additional end-user cost over time.”

RAGING BULL

Rick Lacroix, public relation program manager at storage vendor EMC says there is a precedent for a wait-and-see attitude. “Back two years ago when the SSA [Serial Storage Architecture] Fibre channel argument was raging, we said ‘Whatever our customers want is what we’re going to deliver.’ I think that’s the same type of attitude that we’re going to have on these types of future I/O discussions.

“We’re working with all the organizations, taking a look at the technical requirements and issues and we’ll see what the market’s going to go to.”

The principals agree. “We think it’s appropriate to find common ground to ... find a high speed interconnect structure,” says Andres. “It’s obviously much better for the industry to standardize on one.”

“Of course there’s a benefit in coming togeth-

er,” says Emo. “One standard is better at the end of the day.”

As to what expertise each group brings to the effort, Gruener says, “The attraction of Intel is that they provide a standardized environment that is commodity-based. Multiple vendors can co-exist on the same network. And the NGIO has the advantage in being the first to market. But that doesn’t mean it will be the better of the two products.”

Andres adds that Sun’s involvement with the NGIO began with the corporate opinion that the industry “should standardize on a serial fabric architecture [for I/O] and the NGIO’s specification seemed to be farther along.”

As to the Future I/O Alliance, Gruener says, “IBM has done switched fabric before, HP has plenty of enterprise experience and Compaq has the R&D money. [They] are all great assets to have.”

NO BIGGIE

The NGIO expects to see products based on its standards sometime in 2000, the Future I/O Alliance probably a year later. “We expect to have a full spec by year-end 1999 and prototype products throughout 2000,” says Emo. Commenting on trailing NGIO’s more aggressive

timeline, he adds, “Standards last 10 to 15 years. Six months difference is not a big deal to customers.”

The NGIO spec is “out for final review now,” says

“Standards last 10 to 15 years. Six months difference is not a big deal to customers.”

Andres, adding that the plans are to have the final specification around mid-year. “Companies should show proof of concept product rollouts by mid-year. Our goal is to have products by mid-2000.”

A SPEC UNDER THE MICROSCOPE

At a May 24 press event, the Future I/O announced that Cisco Systems has joined the forum as its sixth promoter, that a pre-release specification was ready for partner review and that it was broadening its specification to allow Future I/O packets to encapsulate Internet Protocol version 6 (IPv6) packets.

“We gave people a heads-up and to let them make some comments,” says William Lee, a technical marketing manager for HP. “We wanted to get them ready for the voting process in the Fall.” The voting process takes place as the group nears the expected final release of v1.0 of the specification in December 1999.

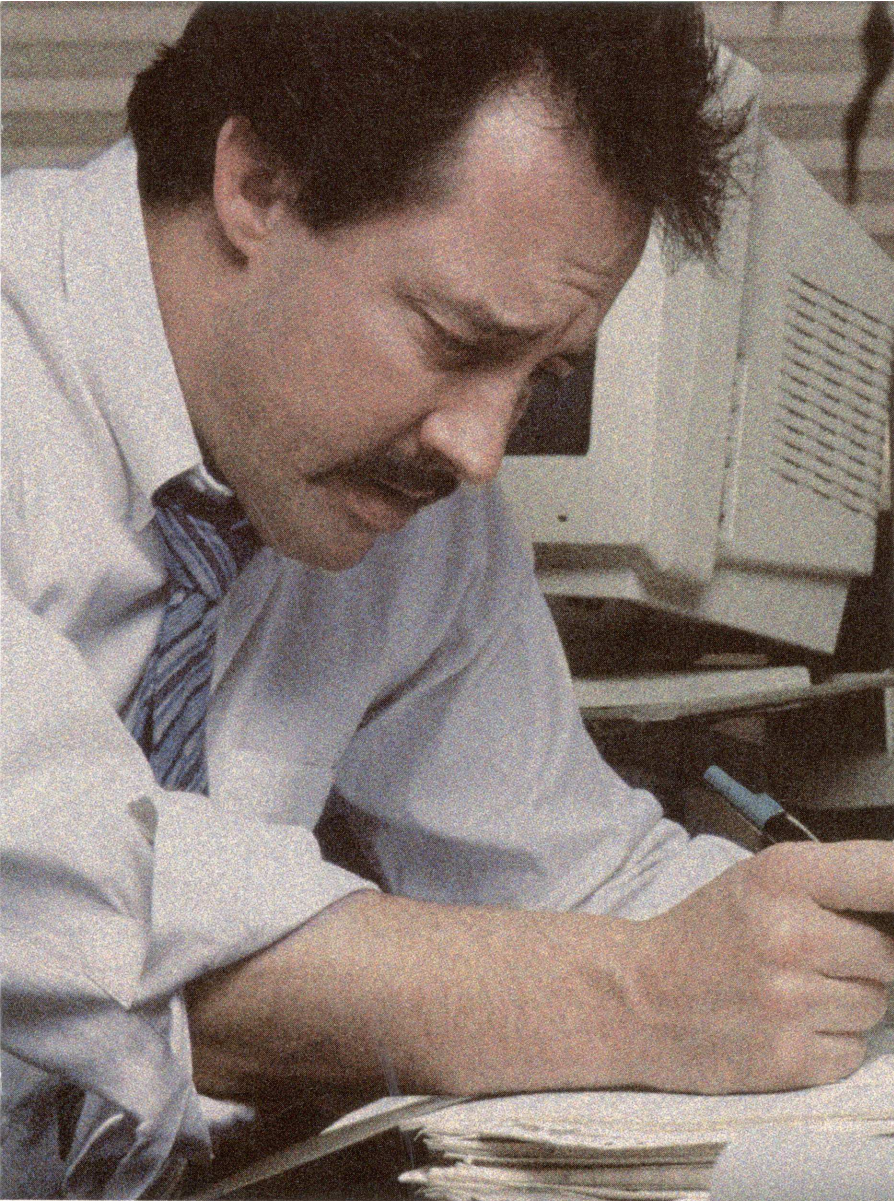
Lee characterized the inclusion of Cisco as “very valuable,” because it owns approximately an 80% share of the router market. Cisco’s support also eases the group’s inclusion of IPv6 technology into its specification.

Lee points to several benefits the group hopes to realize from the inclusion of IPv6. First, it provides 128-bit addressing, “which allows us to virtually address unlimited nodes. A [Future I/O] network can be huge.” Second, it provides an “auto-config aspect,” that lets a new node, once inserted onto the network, auto-define a unique address for itself and broadcast it to other nodes on the network. “It’s a hot plug-and-play concept.”

Third, with IPv6, routers can sense when a connection fails and can reroute traffic to bypass the failing device. “It makes the network more secure and available.”

The business case for adapting IPv6, says Lee, includes the ability to leverage existing technology (IPv4) such as common tools, management and conceptual models, thereby reducing TCO. “It will let companies use the Internet as the main backbone. They won’t have to dedicate lines anymore. They can use the Internet to transport data at Internet speed.”

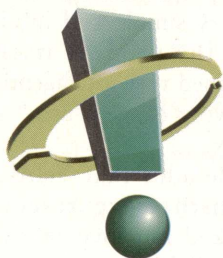
— Ken Deats,
Associate Editor



Your IT budget has
been cut. Again.

And you've got
more connectivity
demands than you
can handle.

Now here's a
solution you
can count on...



Enterprise Now!™

Redefining Enterprise Connectivity

It's a whole new network out there. With slashed budgets and more users demanding access to your IBM mainframe, AS/400 and UNIX hosts, you're under more pressure every day. Fortunately, we've got the solution. Introducing Hummingbird *Enterprise Now!*—the only *complete* connectivity solution for your network—today and tomorrow. *Enterprise Now!* redefines connectivity by offering the highest performing Web-to-Host, Terminal Emulation, Thin X, PC X Server and NFS solutions available—all with a single Enterprise Client License and comprehensive Professional Services. Best of all, *Enterprise Now!* includes **HostExplorer**, **HostExplorer Web**, **Exceed**, **Exceed Web** and the **NFS Maestro family** to give you the centralized management you need to save time and help you cut costs. For the solution you can count on, trust Hummingbird, the world leader in enterprise connectivity solutions.

Enterprise Now!, Exceed, Exceed Web, HostExplorer, HostExplorer Web, and NFS Maestro are trademarks of Hummingbird Communications Ltd. 3Com is a registered trademark of 3Com Corporation. Palm V is a registered trademark of 3Com Corporation. Iridium and the Iridium Logo are registered trademarks and/or service marks of Iridium, L.L.C. ©1999 Hummingbird Communications Ltd.

To win an Iridium™ Satellite Phone or a 3Com® Palm V™, Visit
our Web site at www.hummingbird.com/nc/enterprisenow

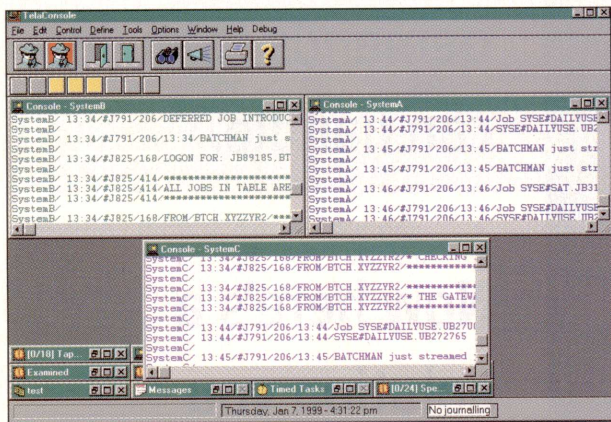
Tel.: (416)496-2200 Fax: (416)496-2207

Email: info@hummingbird.com/nc/hpp

www.hummingbird.com/nc/hpcontest

BCI's Reader
Service Link
hppro.com

Almost Telepathic



TELALERT 4.06

- Provides support for numeric paging, alphanumeric paging, two-way pager, touch-tone telephone, e-mail, electronic signboard and text-to-voice telephone event notification services.
- Includes direct SMTP e-mail notification support.
- Prioritizes event notifications to determine when and how a message will be delivered.
- Runs on HP-UX 10.x and HP-UX 11.x pricing starts at \$3,000.

Telamon Inc.

492 Ninth Street
Suite 310
Oakland, CA 94607-4098
tel: (530) 672-7500

**BCI's Reader
Service Link**
hpro.com

By definition, mission critical applications must continue to function uninterrupted. To help HP-UX administrators ensure adequate detection and response to system and application problems — even if they occur during off-peak or other understaffed hours — Telamon Inc. (Oakland, Calif.) has released TelAlert 4.06, an event notification and management tool.

TelAlert automatically alerts support personnel to problems as they occur and provides the capability for them to respond and correct such problems from remote locations.

"You want to be able to control applications and systems remotely, so that using any two-way telephone, for example, people can come back through TelAlert and

execute any sort of application that they want," explains Guy Smith, Telamon's director of marketing.

TelAlert 4.06 includes the ability to actively manage the content and rotation schedules of message signboards and supports queues of up to 255 messages. Support for e-mail notification has been improved in TelAlert 4.06 with the introduction of direct SMTP, which enables TelAlert users with SMTP servers to route messages through e-mail and specify customizable header fields.

TelAlert can issue notification requests with different priority levels, which can in turn determine when and how — by pager, voicemail, e-mail, phone call — a message is delivered. In this model, an HP-UX administrator can choose to have low priority messages routed directly to e-mail, while high-priority messages can be dispatched via phone call.

But it's TelAlert's stability and scalability that makes it a worthwhile product choice for most HP-UX environments, says Heman Choy, a vice president with systems integrators and consultancy Technology Solutions Co. (Toronto, Ont., Can.), whose firm managed the implementa-

tion of TelAlert for the Canadian subsidiary of a notable U.S. IT giant.

"They were using other paging software that was very unstable and did not have the throughput that they needed," Choy indicates. "TelAlert's great in that regard: It's very stable, and for the last year and a half it's never been shut down, not even for periodic refreshing or other maintenance."

Choy evaluated several other solutions from a number of vendors. But ultimately chose to implement TelAlert. "It performed very well during the stress testing. The programming interface is very simple and intuitive and the product itself is designed very intelligently so it's very easy to use," says Choy.

He adds that TelAlert's robustness represents a marked improvement over the reliability of the legacy paging system that it replaced. "It actually helped solve their problem because we needed it to replace the previous product specifically to resolve stability problems. And throughput limitations. And it has exceeded our expectations on both counts."

*Stephen Swoyer,
Contributing Author*

>Are You Competing in the Digital Economy?



Melillo Consulting Inc., (MJM) a Hewlett-Packard "Best in Class" MasterLevel Reseller, will position you to win this highly competitive race. Our customers gain a significant advantage through implementing innovative eCommerce & Web solutions. We partner with the industries best eCommerce vendors to deliver a complete solution that harnesses your existing assets.

Our solution center provides you with the inside track to the following eCommerce challenges:

> Back Office Integration > Security > Payment Mechanisms > Performance > Monitoring > Evolution

MJM's mission is to be the premier solution architect and integrator of proven and advanced technologies, committed to technical excellence and customer satisfaction.

BCI's Reader Service Link
hpro.com

Microsoft Certified
Solution Provider
Partner

ORACLE
Authorized Reseller

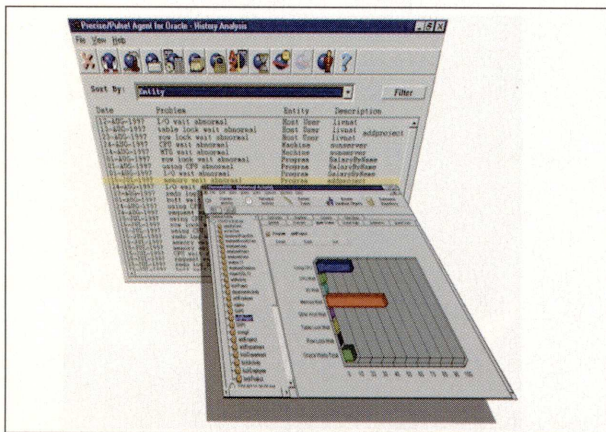
HP OPEN VIEW
Authorized Reseller

HEWLETT
PACKARD
Best in Class
MasterLevel

MJM

MELILLO CONSULTING, INC.
THE POWER OF SOLUTIONS

Database Monitoring - Precisely!



PRECISE/PULSE!

- Provides 24-hour performance monitoring of databases running on Oracle 7.2.2 or newer based on pre-defined performance parameters.
- Sends alerts to DBAs and links to HP OpenView and SNMP-compliant network managers.
- Runs on IBM AIX, Sun Solaris, HP-UX, Sequent Dynix, Digital Unix, and Windows NT.
- Price starts at \$2,000 for each database server; quantity discounts are available.

Precise Software Solutions

50 Braintree Hill Office Park,
Ste. 110
Braintree, MA 02184
tel: (781) 380-3300
fax: (781) 380-3349

BCI's Reader
Service Link
hpro.com

Some analysts estimate that a business loses more than \$35,000 for each hour its database-dependent Enterprise Resource Planning (ERP) applications are not functioning.

The fact is that databases contain much of the information businesses need to be successful in today's competitive markets. Take away that information, even for an hour, and a business suffers serious consequences.

That's why Precise Software Solutions developed Precise/Pulse!, a performance management utility that proactively monitors the performance of Oracle 7.2.2 or newer database applications. When Precise/Pulse! detects an inefficiency in the database application, it sends a warn-

ing message to the database administrator, who then has time to address the inefficiency before it causes a bottleneck, shuts down the database and wreaks havoc with the entire network.

In order to catch these performance leaks before they inundate the network with real problems, Precise/Pulse! monitors the non-productive wait states (including wait for I/O, wait for lock, wait for remote database, wait for MTS and wait for internal database operation) of a network's applications.

If it detects an inordinate amount of waits, it sends an electronic alert message to the e-mail inbox or pager of the designated database administrator. It also logs the alert message in HP OpenView or other SNMP-compliant network management application.

In addition to its more than 140 predefined monitoring parameters, Precise/Pulse! can be customized to monitor user-defined performance parameters as well. Performance parameters can be set by SQL statements, such as the number of full table scans on large tables or the percentage of sorts performed in memory; database design, such as tables with chained rows or indices with wasted

space due to logical deletes; and database, such as the ratio of recursive calls to all other calls or the amount of memory currently allocated to all sessions.

It should be pointed out that Precise/Pulse! is a monitoring application and just alerts database administrators to the existence of performance leaks. It does not provide detailed information about the location or causes of the performance inefficiencies it detects. Businesses who wish to create a complete performance-tuning environment must combine Precise/Pulse! with a separate performance tuning application, such as Precise/SQL from Precise Software Solutions.

A performance tuning application allows database administrators to locate database inefficiencies, pinpoint problem areas and correct the inefficiencies by changing SQL statements and database objects.

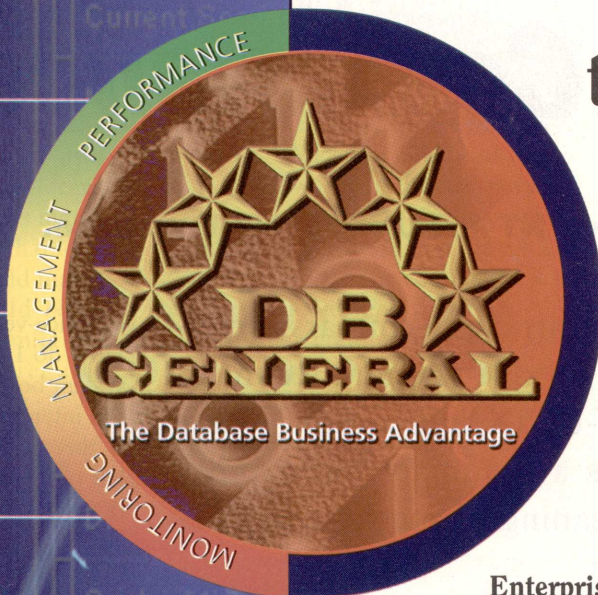
Precise/Pulse! runs on IBM AIX 4.1 or newer, Sun Solaris 2.4 or newer, HP-UX 10.0 or newer, Sequent Dynix 4.2 or newer, Digital Unix 4.0 or newer, and Windows NT 4.0 servers running Oracle 7.2.2 or newer.

— Jeff Dodd,
Contributing Author

A company's survival in today's business climate may well boil down to one vital question...

“Can Your Company Stay Competitive Without the Availability of Mission-Critical Data?”

Today, organizations around the world use **DBGeneral** to ensure the availability of mission-critical data by focusing on three areas of the database: Monitoring, Management and Performance.



Enterprise Monitoring Module

Database Administration Module

Tuning Module

Enterprise Monitoring Module

Real-time diagnostics and proactive alerting and alarming for performance and specific application data issues.

Database Administration Module

A comprehensive set of GUI tools that reduces the complexity of manual, redundant, error-prone tasks.

Tuning Module

Identifies and tunes problematic SQL statements to enhance database performance by reducing system resources.

DBGeneral's Database Business Advantage arms you for the challenge of managing mission-critical data.

For more information, or to request an evaluation copy call: **(800) 621-2808**
www.bradmark.com

In Europe, Middle East and Africa:
Bradmark UK Ltd
Tel: **(+44) 1905 757500**



BRADMARK
The Data Management Company

BCI's Reader
Service Link
hpro.com

© 1999 Bradmark, Inc. All Rights Reserved. DBGeneral is a trademark of Bradmark, Inc.

Planning For A Peaceful Coexistence

Mixing and Managing Windows NT and UNIX in the Enterprise.

THERE'S BEEN NO SHORTAGE of articles, seminars, products and discussions focused on one or more technical component of Windows NT-UNIX integration. What has been missing, thus far, is a roadmap that companies can use to establish meaningful metrics for NT-UNIX coexistence. Until now.

Chris Wood

Interestingly enough, the prevailing industry opinions regarding Windows NT and UNIX have remained relatively unchanged. Ignoring vendor viewpoints and other vested interests, these opinions can be summarized as follows:

- UNIX is more robust — and will likely remain more robust — than NT in terms of performance, capacity, scalability and stability.
- NT is improving and has achieved levels sufficient for growing numbers of workgroup, departmental, divisional and some corporate-wide uses. Moreover, NT is the primary development platform for many application vendors.

IT managers embarking on mixed UNIX/NT projects would be wise to give some thought to what should be done in either category. The motivation for doing so is to address proac-

tively (or maybe reactively) each of the following Integration Drivers.

Storage

How can I share storage between NT and UNIX systems?

How can I consolidate storage (i.e., use a single storage array for all my NT and UNIX needs)?

How can I backup and restore files for a mixed environment?

Is there a single backup/restore solution that can be used for both NT and UNIX?

What are my storage availability options such as RAID, triple mirroring, remote mirroring?

Printing

How can I print from NT to UNIX-based printers and vice-versa?

How can I consolidate my printers, for example, to reduce the number of physical print queues and/or print servers?

Database

How will my UNIX-based applications access my NT-based databases

and vice-versa?

How do I determine which operating system best runs the database product I'm interested in?

Is there any way to reduce the number of different databases I'm currently running?

Remote Application Display

How can I use remote application schemes — such as X-Windows, Citrix — to reduce network bandwidth and simplify desktop asset management?

Messaging/E-mail

How do I integrate my corporate e-mail system (e.g., HP OpenMail) with my departmental e-mail servers (e.g., Microsoft Exchange)? How would I migrate from one to the other?

Internet/Web

What are the Internet components needed for my E-commerce initiative (Web servers, storefront software, transaction monitors, Web traffic managers, etc.)?

What is the best platform for these components?

Middleware

Is there any way for my company to exploit object technology (object request brokers, transaction monitors)?

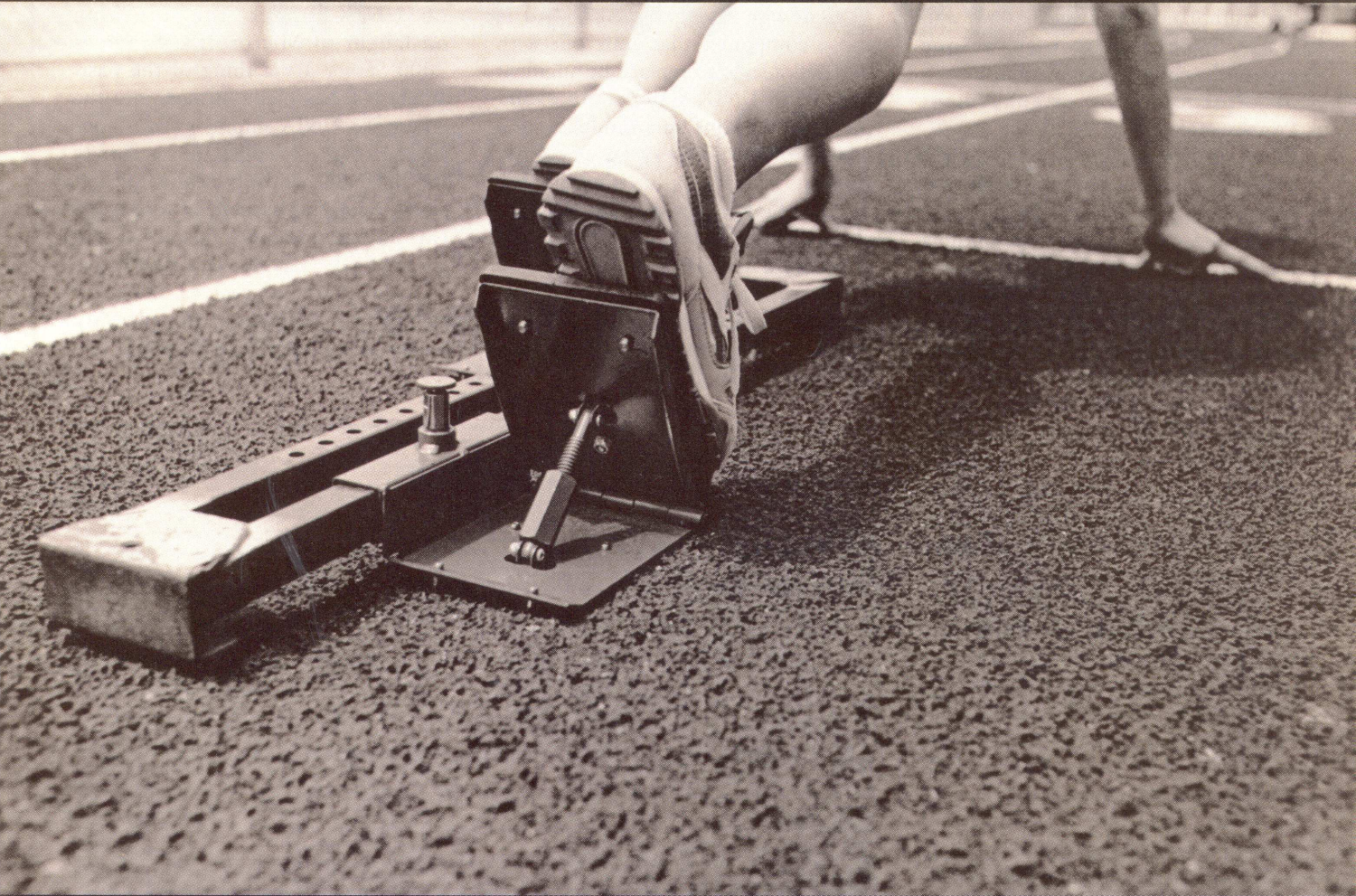
Which framework/broker should I use, e.g., something CORBA-based or DCOM?

Do I have to choose or can I bridge the two?

Job Scheduling

Does a department or enterprise-wide job scheduling capability exist for NT and UNIX, or do I have to address with custom-batch scripts?

*A competitive world offers two possibilities.
You can lose. Or, if you want to win, you can change.*
—L.C. Thurrow



We're changing...and making new strides.

Ever since Bloomfield Computing Solutions became part of the Logical family, we're changing for the better. As part of one of the world's largest providers of network-based IT solutions, our resources have grown and our reach has expanded. And, we're continuing to impress our customers with our ability to understand their needs, customize solutions to fit these needs...and implement them quickly to maximize productivity and generate revenue. After all, if you want to run with the best of them, you better be ready, willing and able to compete.

Change is good. It's only logical.



www.bcomp.com



BCI's Reader
Service Link
hpro.com

 a DATATEC company

Security

How can I most effectively deal with security issues such as authentication and authorization, given that NT and UNIX each has its own unique approaches and requirements?

Monitoring & Management Frameworks (for all the above)

How can I establish a single monitoring and management framework that covers both NT and UNIX?

Given the time, energy and money required to establish this framework (if one truly exists), should I make the investment?

If your NT/UNIX coexistence needs are substantial, engaging in a formal "NT/UNIX Coexistence Assessment" is probably very justified. The deliverables from this assessment should include models of where you are now; where you want to be and a detailed roadmap that describes how to get there.

HP's Colliance program, along with its OpenView and Enterprise Desktop Management Services (EDMS) suites, covers most, if not all, of the above integration categories. For example, a manufacturing company decides to deploy SAP as their mission-critical, company-wide ERP solution. They bite the bullet and invest a lot of time with the notorious SAP-sizing questionnaire. They quickly realize that, given their requirements, UNIX is the only real game in town — and opt for clustered HP 9000 database and application servers.

They come to the simultaneous conclusion that for "specialty" servers such as reporting, Web and remote access systems, NT is more than up to the task — and opt for HP NetServers for those purposes. This example is becoming more the rule than the exception. The aforementioned company is fully exploiting the respective power and cost effectiveness of UNIX and NT.

Most companies that have NT and UNIX integration requirements started out as UNIX shops that decided to add NT. This is a very established and easy to understand phenomenon.

NT has lots of momentum with software vendors and is usually cost-effective.

A newer and growing trend is those companies that start out with NT and decide to replace or augment them with UNIX systems. An example that explains this tendency is a small- or medium-sized company running Oracle applications on NT but was "jolted" by a spurt of acquisitions that required support for 500 concurrent users instead of the 300 being nicely served by NT. Fortunately, the company was able to protect their investment by re-deploy-

ing the NT systems as application, e-mail and file/print servers.

Past predictions about the demise of UNIX under the crushing onslaught of Microsoft's Windows 2000 Server are a thing of the past. While NT has made inroads into the enterprise, UNIX shipments have continued to grow, albeit more slowly than the still relatively new Microsoft server operating system. According to the latest market figures from Dataquest, UNIX shipped over 425,000 units last year vs. NT's 1.3 million. Conversely, it probably comes as no surprise that vendor rev-

FORKS IN THE UNIX/NT ROADMAP

Theoretically, all IT actions should be driven by business needs. In practice it can sometimes be difficult to stick to this principle. Despite this, the questions, "How does this impact an identifiable business need?" and, "How can I measure this impact?" should be asked of all NT-UNIX implementations.

NT and/or UNIX?: Numerous factors need to be considered when selecting NT or UNIX or both. Things like application availability, support staff availability and background, acquisition costs, total cost of ownership, performance, capacity, scalability, resiliency and ease of management are but a few of the considerations.

Application Selection: Business needs, not operating systems, should dictate application (and database) selection.

Server/OS Selection: Now it's time to select the operating system — NT or UNIX or both!

Integration Drivers: Whether or not you think they apply, make sure you learn about all available integration drivers listed in this article as a starting point.

Scrutinize: Make sure you understand each of these integration drivers and what, if any, potential near-term or long-term benefits they bring.

Review Costs: Be careful! Sometimes the ultimate cost of implementing an NT-UNIX integration capability will exceed any derived benefits. On the other hand, biting the bullet and establishing an integration feature now (single sign-on, for example) may be a good idea even if the true benefits are not realized until later.

Implement: Use your own resources or external solution providers if necessary.

—C.W.

If your NT/UNIX coexistence needs are substantial, engaging in a formal "NT/UNIX Coexistence Assessment" is probably very justified. The deliverables from this assessment should include models of where you are now; where you want to be and a detailed roadmap that describes how to get there.

venues generated from sales of UNIX-based systems are, on average, significantly greater than NT. Other operating systems like NetWare, OS/400 and MVS will not vanish, but aren't expected to do much more than hold their own relatively small market shares.

In a nutshell, the server operating

system landscape is now — and will continue to be — mostly comprised of high volumes of low to midrange NT systems and smaller volumes of higher-end UNIX-based systems. All UNIX systems vendors have plans for porting UNIX to Merced, anticipating what many believe will be strong customer interest in running UNIX on a

64-bit Intel CPU. If anything, UNIX's value has increased as its performance, capacity and reliability characteristics have attracted users building larger-scale ERP, supply chain management, business intelligence and around-the-clock E-commerce storefronts.

If you're not running NT and UNIX, you probably will be soon enough. So it pays to investigate where you can "glue" them together in order to maximize efficiencies and minimize complexity.

— *Chris Wood is the alliance manager for Forsythe Solutions Group (Skokie, Ill.), the largest nationwide reseller of Hewlett-Packard computing equipment for the past three years.*

Article Reprints

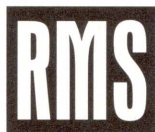


Reprints of any article in **HP PROFESSIONAL** are available online and in print from Reprint Management Services, our exclusive reprint agent. High-quality article reprints can help your organization in many ways by:

- Serving as a **PROMOTIONAL TOOL** for trade shows, mailings, and conventions.
- Increasing **EXPOSURE** for your products and services.
- Providing a powerful **EDUCATIONAL RESOURCE** for your employees and peers.

We tailor the reprint layout and design to your needs. Reprints are more affordable than you think.

Minimum order of 100 for black and white and 500 for full color.



**REPRINT
MANAGEMENT
SERVICES**

Phone: (717) 560-2001
Fax: (717) 560-2063
E-mail: sales@rmsreprints.com
<http://www.rmsreprints.com>

BUY • SELL • LEASE

**HIGHEST QUALITY
REFURBISHED
HP EQUIPMENT
WITH PROFESSIONAL SUPPORT
AT A FRACTION
OF THE HP PRICE**

NHCSI

New Hampshire Computer Systems International LLC

Your Competitive Source for HP Systems & Peripherals

- 9000/3000 Equipment • Immediate Availability
- Up to 80% Off HP List Price

603.433.8405
www.nhcsi.com

See Us At HP World '99 Booth #1245

**BCI's Reader
Service Link[®]
hpro.com**

Putting Some *Cluster* On NT Clusters

Ryan Maley

Clustering products for Windows NT platforms are available in several varieties, offered from Microsoft as well as other vendors. Microsoft's products are centered on Windows NT Server Enterprise Edition, which offers SMP capabilities for up to 32 processors. The Enterprise Edition is comprised of Microsoft Cluster Server (MSCS) and Windows NT Load Balancing Service (WLBS).

Introduced in 1997, MSCS has been available as a system service in NT Enterprise Edition. MSCS allows the creation of two-node, share nothing clusters. The cluster appears as a single server to network client machines. Any applications or data files installed on the cluster are referred to as resources. These resources run on only one server at a time but can be configured for *failover* (a process by which the oper-

ation of the resource is moved from one server to another in the event of a failure).

IF AT FIRST YOU DON'T SUCCEED

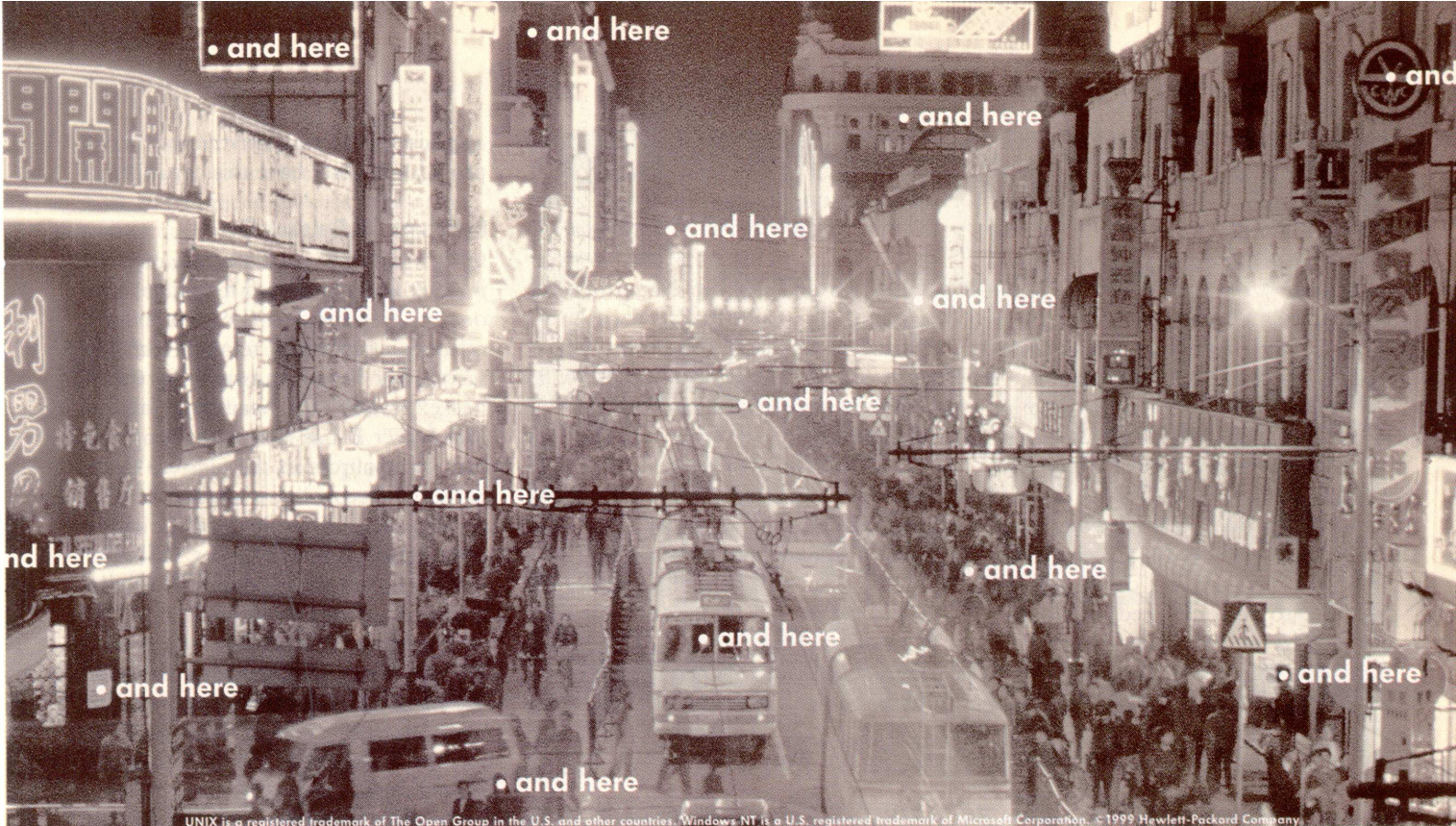
Resources can be organized into groups and entire groups can failover as well. When a specific resource is requested, MSCS routes the request to the server operating the resource.

An MSCS cluster consists of servers, common storage and networking. The servers must be single or multiple Intel Pentium (minimum 90MHz) or Compaq Alpha processor-based (Intel and Alpha processors cannot be mixed in the same cluster).

Each server requires a minimum of 64MB of RAM. Each server must be connected to a shared, external SCSI

bus that is separate from the bus containing the system disk. The SCSI adapters must be PCI. All resources configured for failover must reside on disks on this common bus. To provide maximum protection from hardware failure, storage on the common bus should be hardware RAID-based to eliminate the disks as a point of failure. Two PCI network cards should be used in each server: one to connect to the organization's network, the other to create a private network between the two cluster systems.

So how does MSCS provide high availability? The servers in the cluster constantly check available resources by sending messages called "heartbeats." The heartbeats check all resources on both servers. If an application resource has failed but the server is still functioning, MSCS tries to restart the application. If the appli-



UNIX is a registered trademark of The Open Group in the U.S. and other countries. Windows NT is a U.S. registered trademark of Microsoft Corporation. © 1999 Hewlett-Packard Company.

We don't care where your data comes from. We can store it. As businesses and consumers become more connected to e-services, volumes of new data will be arriving from unimaginable sources and across multiple platforms. Whether from mainframes, UNIX[®]-based systems or Windows NT[®] servers, your data needs to be securely stored yet readily accessible by you, your customers and your business partners. Introducing HP SureStore E—our full line of stress-free storage products, a key component of HP's high-availability solutions and "5nines:5minutes" strategy, including single-storage subsystems with up to 9 terabytes of storage connecting to virtually all environments. From solutions consulting to storage management, HP provides a combination of hardware, software and services that helps prepare your business for the e-service-based economy. For more information about our stress-free SureStore E storage solutions, visit us at www.surestore-e.com.

Stress-Free Storage for the next E. E-services.

cation will not restart or the server has failed, MSCS moves the application's resources and restarts it on the second server. Because both servers are constantly checking each other, discovery of failed resources and initialization of the failover usually takes place within 10 seconds. The amount of actual time to failover depends on the application. As an example, according to Microsoft, failover of SQL Server usually occurs in less than one minute.

Failover occurs automatically. Because the cluster appears as a single server to clients, client computers do not have to be configured in any special way to use the cluster or handle a failover. Whether or not the client actually notices the failover depends on the nature of the application. For instance, delivering Web pages is

state-less. That is, the connection is not maintained and communication is discrete and independent. So if the failover occurs between requests to the server, the client may not notice. If the failover occurs during the request, the client may receive a "Server Unavailable" message. Once the failover is complete, the client will be able to get pages again. Hitting the refresh button on the browser is all that's necessary to actually get the requested page. Of course, the client may wonder what happened.

If the application maintains a state, a new logon may be required after a failover. This is dependent on the application. For instance, an application such as SQL Server may cache the user id and password and be able to re-establish the connection without the user doing anything at all. If the

application is not cluster aware, it probably doesn't have this capability.

SOMETHING TO FAILBACK ON

Once a failure is corrected, no manual intervention is required for *failback* to occur. Failback is the process of returning resources to their default server. For instance, assume Server A has experienced a hardware failure and Server B has assumed all operation of resources in the cluster. Once Server A is repaired, it's rebooted and rejoins the cluster. It communicates with Server B and initiates failback, bringing back the resources it usually hosts, resuming operations.

The second clustering component on Windows NT Enterprise Server is WLBS. It has support for any IP-based service such as Web or FTP servers. It supports the clustering of

A CLUSTER OF OTHER CLUSTERING PRODUCTS

There are non-Microsoft clustering and cluster management products for Windows NT. "Some providing far more nodes and far more capability than Microsoft," says Harvey Hindin, senior research analyst for D.H. Brown Associates. "They just got tired of waiting for Windows 2000," he chuckles. Here's a sample of some of them.

Marathon (Boxborough, Mass.; www.marathontechnologies.com): HP and Marathon Technologies Corporation have just announced a deal that will offer Marathon's Endurance Assured Availability non-stop array with HP NetServers. The Endurance system is designed to provide 99.999% uptime and Marathon has offered a \$250,000 warranty against data loss with some of their products. "This is not really clustering," says Hindin, "but multiple servers." HP is expected to announce several configurations bundled with service and support options.

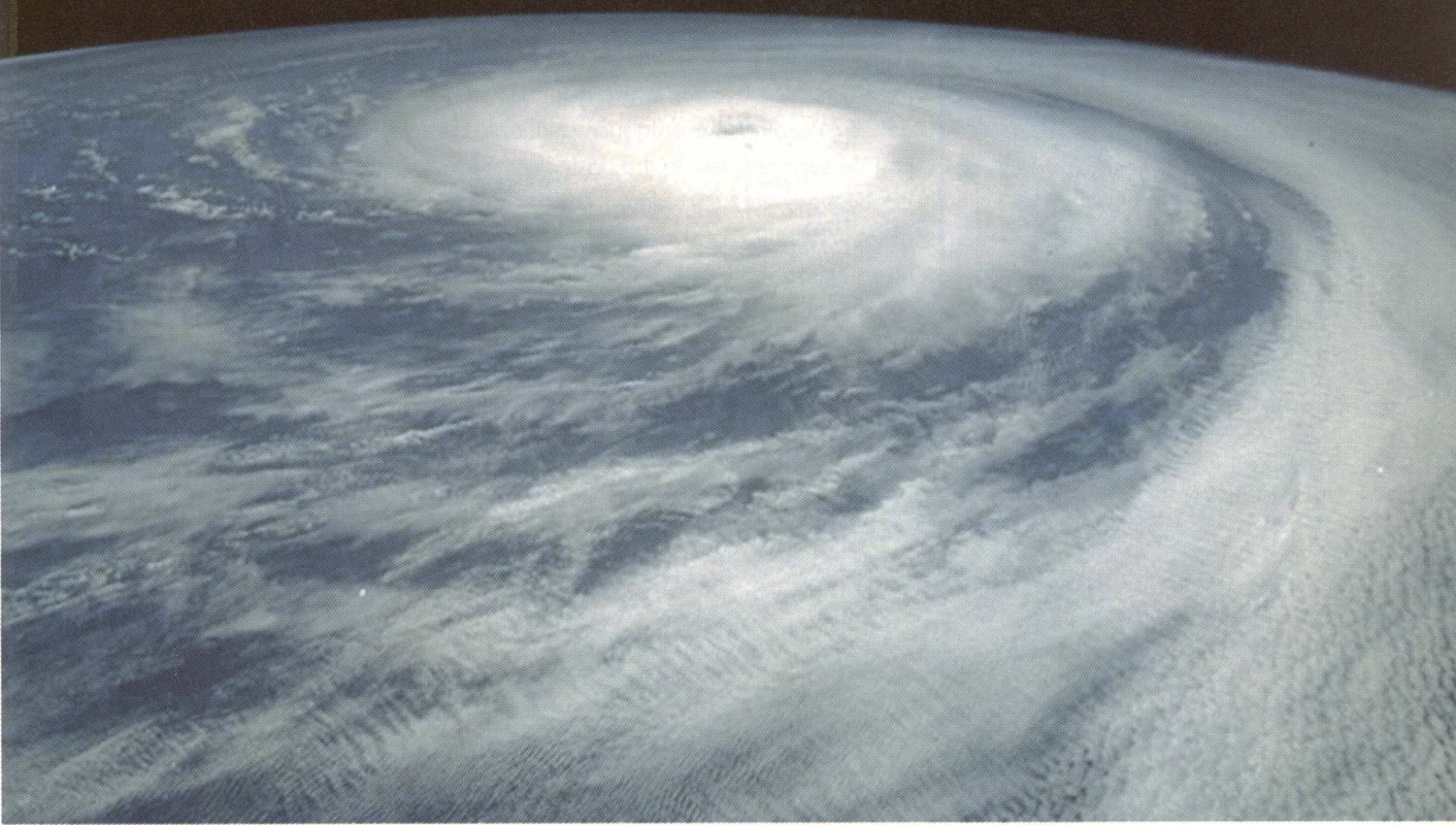
IBM: "IBM is about to announce enhancements so that Cluster Server will work with up to eight nodes," says Hindin. The announcement will be centered on IBM Netfinity hardware. The product is expected to include features such as hot-swap PCI hardware. IBM currently offers two-node Netfinity packages bundled with support and performance guarantees. The Netfinity Availability Extensions will sit on top of MSCS and offer cluster management software featuring administration capabilities and tracing and logging services.

Vinca Corporation (Orem, Utah; www.vinca.com): Co-Standby Server for NT (see *HP Professional's* Product Watch, May 1999) provides a shared nothing cluster of two nodes. The systems in the cluster communicate via a "bi-directional mirroring process" which keeps the data on both servers current and in-sync. If a system fails, the other system takes over. With mirroring solutions such as Vinca, some data loss may occur if a failover occurs before the mirroring process is complete. It does provide a more secure backup than MSCS by keeping a second copy of the data available. Vinca also has versions of Co-Standby server for Novell NetWare and IBM Warp Server.

NuView, Inc. (Houston, Texas; www.nuview.com): ClusterX 2.0 is due for release this month. The company claims it's the "first and only cluster management solution to integrate the management of both Microsoft MSCS- and WLBS-based technologies." ClusterX provides a single console to manage both current Microsoft cluster technologies. The single interface allows not only control and configuration, but performance reporting and audit logs to monitor cluster activity.

— R.M.

New Outlook



The world of technology is changing every day. To stay ahead of the curve, we must not only recognize change, but embrace it. That's why **Infoworld Enterprise Solutions** has changed its name to **AdvizeX Technologies**. This new name is a true reflection of our business today... and tomorrow. As we take on this new identity, you can be sure we're still the same company you've trusted for the last 25 years. Learn more about our name change and ways we're moving into the e-world by visiting us online at www.advizex.com.



ADVIZEX
T E C H N O L O G I E S



BCI's Reader
Service Link
hpro.com

Visit us at
HP World '99
Booth #1409

up to 32 servers using the shared nothing model. As in MSCS, the cluster appears as a single server to its clients. WLBS is different from MSCS in that many servers in the cluster can offer the same resource. When a request comes in under MSCS clustering, the request is routed to the server that controls the resource because only one MSCS server can offer the resource at a time. When a request comes into a WLBS cluster, the request is routed out to a server based on the traffic in the cluster. Servers may be designated to handle a certain percentage of the requests or they may divide the workload evenly. This is load balancing.

By providing the identical service from multiple systems in the cluster, WLBS provides true availability and scalability for many applications. When one system in the cluster goes down, traffic is automatically directed to the servers still operating. When more users need to be serviced, add a system to the cluster.

WLBS runs as a device driver under NT. It uses an algorithm to determine how to divide the workload. Each node in the cluster runs the algorithm independently so the load balancing is not dependent on a single system and not subject to a single point of failure. The workload is distributed statistically rather than dynamically. In other words, the workload is divided among servers based on parameters set by the system administrator, not by dynamically adjusting the load based on how busy each server in the cluster actually is. Workload can be distributed evenly or more powerful servers can be given a higher percentage of the work.

WLBS communicates within the cluster in a fashion similar to MSCS. In WLBS, the process is called *convergence*. A heartbeat is broadcast once a second by each server to all the servers in the cluster. If a server does not respond to five consecutive heartbeats, convergence begins. During the convergence process, the heartbeats are sent out twice a second. Each server communicates with all the other servers until they agree on the status of the cluster. This is necessary because WLBS runs on each and every

COMING TO TERMS WITH CLUSTERING

A cluster is any set of independent, whole computers that work together as a single resource and appear as a single computer to end-users. In general, clusters are used to address two specific computing problems: availability and scalability.

LET ME TAKE YOU HIGHER

Availability refers to the amount of time a system is available for clients. A database is a great thing when it's running, but useless if it's not. By keeping the database available, orders can be taken, customers can be serviced, etc. In the past, only a few systems were considered critical or were only considered critical during normal business hours. Now, as new systems and applications become central to organizations, it's more important than ever for them to be *highly available*.

Availability is usually defined as a percentage of uptime. A particular vendor may guarantee uptime at 99.5% or 99.9%. This may not seem like a large difference, but based on continuous operation of 24 hours a day, 365 days per year, the difference is quite large. Because the cost of downtime is so high, even a single hour of downtime may be unacceptable.

<u>Availability</u>	<u>Downtime per Year</u>
99.000%	87 hours 36 minutes
99.5%	43 hours 48 minutes
99.9%	8 hours 46 minutes
99.95%	4 hours 23 minutes
99.99%	53 minutes
99.999%	5 minutes

SCALING NEW HEIGHTS

Scalability refers to the ability to provide more computing services transparently. When the hits on your Web site reach an all time high and performance begins to degrade, what do you do? You can upgrade or replace your Web server with more powerful hardware, which requires bringing the server down. Depending on the nature of your site, bringing a server down could mean lots of lost revenue.

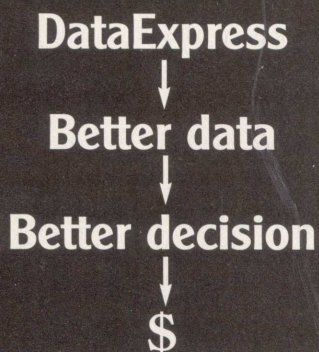
Clusters address scalability by allowing the addition of capacity without interrupting the delivery of service. This approach offers a large benefit: You don't have to forecast demand accurately. If your usage prediction is low, you can add another system to a cluster. As demand increases, you can incrementally add smaller systems to meet the demand. Without a cluster, you must either be very accurate in your demand forecast or make up-front commitments to larger, more expensive servers with headroom.

— R.M.

**Secure
end-user data
access-
an oxymoron?
Not with
DataExpress.**

"DataExpress is an easy-to-learn and easy-to-use tool that empowers even the casual, unsophisticated user with sophisticated data access and extraction capabilities".

John P. Burke



DataExpress Provides:

DESKTOP	
Terminal	✓
PC/Mac	✓
CONNECTION	
16-bit ODBC	✓
32-bit ODBC	✓
Serial/Modem	✓
Winsock	✓
FILES	
SQL/Non-SQL Datatypes	✓
KSAM & MPE file Access	✓
PowerHouse Support	✓
SECURITY	
Field Value Security	✓
User Profiles	✓
Dataviews	✓

Data is just data – until you turn it into information.



DataExpress

The #1 ODBC Driver and a lot more.

For years, DataExpress has made it possible for you to selectively and rapidly extract data from HP3000 data structures. Now, with the ODBCLink option of DataExpress, M. B. Foster Associates continues to create the tools today, for the needs of tomorrow.

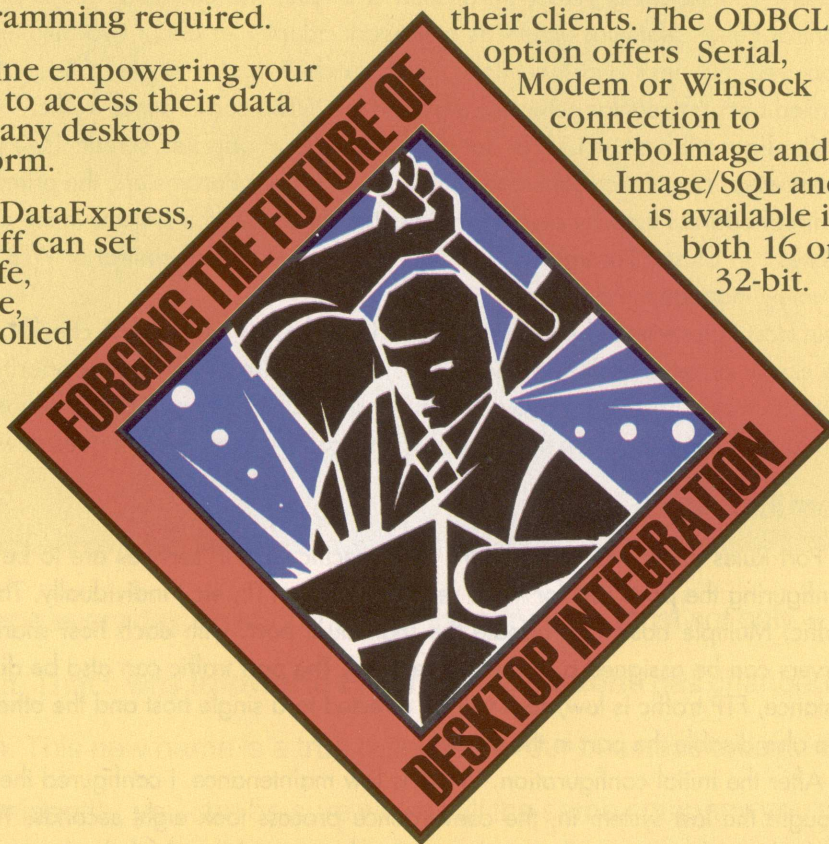
With DataExpress, you put corporate data into the right hands at the right time-on request or scheduled-with no programming required.

Imagine empowering your users to access their data from any desktop platform.

With DataExpress, IT staff can set up safe, secure, controlled

environments and custom views, to allow end users access to their own data. With a simple click or keystroke, users can automatically download their information to their desktop applications - freeing up IT time for more complicated projects.

M. B. Foster Associates' ODBCLink/SE was chosen by Hewlett-Packard as the best solution available for their clients. The ODBCLink option offers Serial, Modem or Winsock connection to TurboImage and Image/SQL and is available in both 16 or 32-bit.



Why settle for less, when we provide the best. For the #1 choice in data access tools, call M. B. Foster Associates at 1-800-ANSWERS (800-267-9377) or 1-613-448-2333. Or visit our website at www.mbfoster.com

M. B. Foster Associates Limited

82 Main Street South, Chesterville, Ontario, Canada, K0C 1H0
(613) 448-2333/ 1-800-267-9377, fax: (613) 448-2588
e-mail: info@mbfoster.com, Website: www.mbfoster.com

WINDOWS NT LOAD BALANCING SERVICE — ON BALANCE, GOOD ENOUGH

The Windows NT Load Balancing Service (WLBS) is part of Windows NT 4.0 Enterprise Edition. It's not included on the distribution disk, but is available from Microsoft at www.microsoft.com/ntserver.

Installation of Enterprise Edition is annoying, but not difficult. The package comes with four CDs. Two contain Enterprise Edition, one contains Service Pack (SP) 4 and the last contains the Windows NT Option Pack. Microsoft continues to offer SPs instead of integrated version releases of the operating system.

This forces several steps during installation. I had to install NT. When the system rebooted, I was told to continue with the installation by installing SP 3. After installing SP 3 and rebooting, I had to install any Enterprise Edition Components, such as MSCS. After the third installation and reboot, I had an operating system. To get the latest version of Internet Information Server, I had to install the option pack, which also required that I install Internet Explorer 4.01. All told I had four (or was it five?) reboots. I didn't even bother with SP 4.

INSTALLATION IS SIMPLE

After downloading WLBS, installation is simple. The download file is slightly less than 2MB. It installs from the *Control Panel*, *Network* option as a network adapter in about two minutes. I installed WLBS on a cluster of four machines, two Intel and two Alpha. Each machine had a single 10Base-100 Ethernet network interface card that carried both the regular network traffic and the WLBS convergence traffic.

Configuration of WLBS is done on a single *Properties* screen (see page 27) with three sections: *Cluster Parameters*, *Host Parameters* and *Port Rules*. In Cluster Parameters, the primary IP address of the cluster is set. This is a virtual address used by clients to access the cluster. All the systems in the cluster must be set to the same primary IP address. In Cluster Parameters, you can also enable remote control of WLBS so other machines on the network can remotely manage the cluster.

In Host Parameters, the system's unique IP address is assigned. A checkbox makes the system an active member of the cluster or removes it from the cluster. You can also assign a host priority. Each system in the WLBS cluster must have a unique host priority. By default, cluster traffic is handled by the host with highest priority. The priority also controls which systems are first to pick up the traffic when a system goes down.

PORT RULES RULE

Port Rules allow you to configure how specific TCP/IP services are to be handled by the cluster. This is done by configuring the ports (80 for Web services, 21 for FTP, etc.) individually. There are several options for directing the traffic. Multiple hosts can handle the individual port, with each host sharing the load equally or more powerful servers can be assigned a higher percentage. The port traffic can also be directed to a single host in the cluster. For instance, FTP traffic is low, so it will be directed to a single host and the others will be free to serve Web pages. You can also disable the port in the cluster.

After the initial configuration, WLBS is low maintenance. I configured the cluster as an FTP and Web server. As I brought the last system in, the convergence process took eight seconds. The different platforms (Intel and Alpha) worked together very well. As I disconnected one machine, the failure was detected and the systems reconverged in 11 seconds. I tested the failover using a script that demanded refreshed Web pages via a browser. As the system "failed" (was unplugged) there was a noticeable pause, which I didn't think was unusual, given the sometimes choppy performance of the Web.

I was generally satisfied with WLBS, but the system is noticeably lacking in management tools. There's no place to see which systems are participating or what the traffic is like. You can determine the participation by checking the Event Viewer. A message is logged at each convergence, listing the host in the cluster. Hardly an optimum solution. I couldn't find any Performance Monitor counters or objects relating to WLBS. A glaring error, the lack of management tools may be a function of the relative newness of the product and hopefully will be corrected in subsequent releases, but for quick, no frills clustering, WLBS does the job.

server in the cluster and they must each have consistent information. This convergence process takes place when the cluster first starts or when systems enter or leave the cluster. No services are interrupted during convergence. The convergence messages and heartbeats are approximately 1.5KB and consume little bandwidth. In fact, no special or dedicated network interface is required. The convergence process takes place on the same interface as all other network traffic.

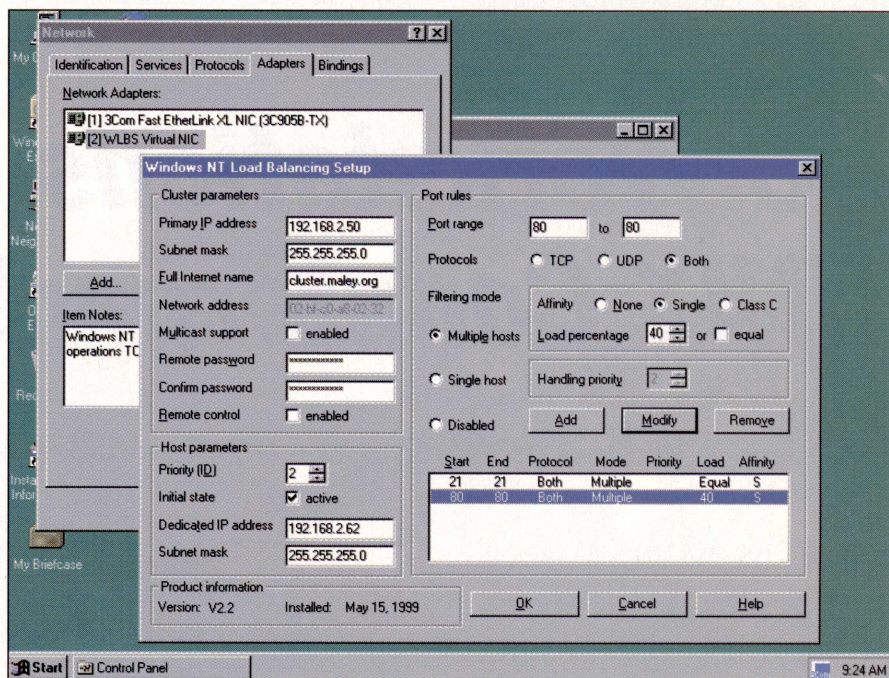
WLBS is ideal for Web servers and similar Internet applications. As a Web site becomes popular, it may experience rapid growth. If the site is run with a WLBS cluster, it's easy to add new capacity by adding new systems. Because they are standard NT systems, not even requiring a second network interface card, they can be added very cost effectively.

APPLICATION EQUILIBRIUM

Component Load Balancing (CLB) is a new Microsoft clustering technology that will be included in Windows 2000, (a.k.a. Windows NT 5.0), and will provide application clustering through Component Object Model (COM) components. CLB is scheduled for inclusion in the *Advanced Server* and *Data Center* versions of Windows 2000. Advanced Server will support two-node MSCS clusters and Data Center will support four-node MSCS clusters.

CLB enables applications built using COM components to be distributed across a group of servers. Microsoft is positioning CLB as middleware that will provide high-availability features to systems such as Internet Information Server with Active Server Page applications. CLB will function like WLBS by providing load balancing. However, it goes one step further and is able to dynamically load balance by checking a server's performance through such measures as object response time and CPU load. The CLB model features a CLB routing server that handles requests from clients.

The routing server determines which node in the cluster is best able to fulfill the request and communi-



The NT Load Balancing Properties Screen. The FTP service is load balanced equally and the Web service load is 40%.

cates this information to the client. The client then communicates directly with the specific server, leaving the routing server free to handle more requests and perform load balancing. In the event one of the servers in the cluster fails, the CLB routing server starts the COM component on another server in the cluster.

CLUSTER MUSTER

It may be difficult to immediately see how these various clustering technologies can be used together. "Cluster Server [MSCS] provides high availability and data integrity," say Kevin Briody, Microsoft's product manager for clustering and load balancing. Briody says that Cluster Server was primarily designed to secure data. The focus of WLBS is scalability. "It's a function of how they were designed. Load Balancing is an NT device driver. It has no way to know a database is running as a separate instance on another machine."

Briody describes a "two-tier approach" to clustering. "Web servers will be clusters for e-commerce using WLBS. Database servers will be clustered with MSCS." In the first tier, WLBS provides high scalability and availability for Web servers sending

pages to users. As actual transactions occur, MSCS can insure database integrity by providing a server failover to a common disk storage system.

Briody believes the future is actually in a three-tier system. "NT 4 just has two technologies. Windows 2000 will provide a third tier." CLB will provide clustering for application services such as Microsoft Transaction Server. The three-tier approach will provide organizations with the ability to provide systems that are not subject to single points of failure and can grow to match the Internet's explosive growth.

Clusters are not necessarily the perfect solution to all your problems. Clusters cannot protect against things such as power failures. As systems become more and more critical, even the short failover times with current clustering technology can mean serious data loss. But Microsoft and others are investing heavily in cluster technology that they hope will drive NT further into the enterprise.

— Ryan Maley (ryan@maley.org)
is a Microsoft Certified Systems
Engineer and author of
*HP Professional's On The
Server Side* column.

PC Workstations Outflank UNIX Counterparts

HP Opens A Window Or Two Into The PC Workstation Market.

As UNIX WORKSTATIONS descend from the peaks of technical computing, Windows NT is scaling the heights. Industry watchers say they'll meet in the middle soon. So, what is the state of the NT workstation market? Who does HP see as its major competition? And, what does the future hold?



HP Visualize Personal Workstations are making an impact in the Windows NT technical computing market for design engineers, scientists and artists.

Ken Deats

“The UNIX [workstation] market peaked about two years ago,” says Scott Elder, a product marketing manager for HP Visualize workstations. “It’s in decline now and the erosion is happening predominantly through NT.”

Elder says that 90% of HP’s customers are “welcoming NT into their PA-RISC environment,” in some capacity, and technical users are no different than run of the mill administrative users. They want a single system to run their mission-critical

graphic as well as administrative applications. They need less expertise to maintain NT workstations, which lowers their TCO and they have more vendors to choose from.

He adds that smaller companies, with just one or two applications on their networks, are generally much faster to add NT workstations into their mix. “As more [graphic] applications port to NT, small shops make the move easier. Large shops ... have to have all their applications ported before they move.”

Elder says that HP differentiates the segments of its NT workstation marketing strategy by segmenting the

product lines and the sales approach for each category. At the lower end, he says that the Kayak and Brio workstations are “similar to what IBM and Compaq are offering and our channel strategy meets the need for them.”

At the higher end, in the P- and X-class workstations, the approach is one that does not just focus on the product but involves the channel as well. “We can market directly through distributors or focused resellers that are identical in capabilities as our HP-UX resellers. They’re just focused on the technical market arena. You don’t see IBM, Compaq



Get HP CERTIFIED Today

Introducing HP Certified,
a new certification
program for IT
professionals with
expertise in HP-UX
or HP OpenView.
If you're a System or
Network Administrator,
take this opportunity
to gain recognition
for your knowledge
and skills.

HP Certified tracks are
based on what you do
on the job: HP-UX System
Administration, Network
Management, UNIX
Server & Applications
Management, and NT
Server & Applications
Management. Becoming
an HP Certified IT
Professional validates
your technical expertise.
You can benefit from
greater productivity
and increased job
satisfaction.

- To register for HP
Certified exams, call
Sylvan Prometric at
1.888.895.6162, or visit
www.prometric.com
(US and Canada only).
- To learn more about
HP Certified, visit
[www.hp.com/education/
certification](http://www.hp.com/education/certification), or call
1.800.472.5277



or Dell doing that.”

In assessing the major competitors he sees in head-to-head competition every day, Elder sees SGI as being the closest to follow HP's model. But because SGI, which has traditionally been a UNIX-only provider, has just entered the NT market with its models 320 and 540, at least initially they'll want to create a wider distribution channel just to get the product out there. As to the big three on HP's radar screen — IBM, Compaq and Dell — he says that while IBM and Dell can sell direct, Compaq is “still wavering.”

This direct to the public approach, has served Dell well for PCs. “In large enterprises, however, Dell rarely makes the short list,” says Elder. The perception in those accounts is that

Dell doesn't invest in boosting the quality and performance for the mission-critical applications required by companies such as Ford or General Motors.

BREAKING TRADITION

Unlike its more traditional UNIX cousin, where each vendor maintains a proprietary hold on the components in the box, each NT workstation vendor starts on common ground: with an Intel CPU, usually the Pentium XEON. What differentiates them, says Elder, is the approach each takes to the graphics subsystem employed.

“Every Intel-based PC can run Excel and Word. With technical workstations, there's more opportunity for things to go wrong between the application and the system.” He adds

that customers want ISVs to say what systems are certified to run their software and how well they run it. “The quality and performance of the graphics subsystem matters. It's important to maintain good relationships with the ISVs to assure these customers.”

HP's Visualize subsystem, while comprised of industry standard components, is available only on HP workstations. “HP chose to make that the differentiator,” says Elder. “Compaq, IBM and Dell each integrate off-the-shelf commodity components so there's no value add. SGI has its own memory controller, which is a very custom design. That puts constraints on the graphics [software you can run].”

As to what the near future holds for the NT workstation market, Elder says, “The industry is going to see a bump in the road this fall with the new Intel processors.” Those expected new processors are a follow-up to the Pentium III, code named “Coppermine” and a follow-up to the Xeon, code named “Cascade.”

Elder sees the Cascade focusing more on multi-process technology, making it more attractive as a “high-performance server chip.” But the proposed integrated cache, able to run at the same speed as the processor, will make the Coppermine the front runner as the new workstation standard. “We think customers will be very satisfied with Coppermine and Xeon will be a smaller percentage of workstation sales.

“HP's focus will be to take [Visualize] graphics as seen today and move them forward transparent to the applications and how to deliver better application performance at the system level,” he adds.

And, in keeping with the trend towards open systems, Elder says to look for Linux on Visualize workstations this year. “The big gap is still application availability. But Linux is finding its place in certain areas.” He says that home grown Linux graphics applications are starting to appear and some others are porting to Linux more reliably than to NT. ♦

A LOOK AT THE NT MARKETPLACE

We asked Jay Moore, senior analyst for the Aberdeen Group (Boston, Mass.) for his thoughts on the players in the NT workstation marketplace:

HP — I'm a little bullish on HP now. Their strategy of combining Kayak and HP-UX together [as one unit] in Ft. Collins, Colo. is a very good move. And they're starting to assimilate NT to folks who depend on performance.

Compaq — Management problems have decimated the workstation division and it will take some time for the merger [with DEC] to wash out. The product line is in a bit of a rut. Customers see the Alpha as a server but not as a viable workstation. They're in a market gray zone: Low-price customers choose Dell and high-end customers choose HP and IBM.

Dell — They took the [NT workstation] market by storm. They said ‘We'll get the best performing boards, slap them together and sell them cheaply.’ Workstation customers see themselves as being above the PC community, but when push comes to shove, they're still looking for the cheapest box.

IBM — Customers on the RS/6000 are glad to see the IntelliStation. They've made some deals with important board suppliers. They talked about application performance long before anyone else and they present a complete story.

SGI — The market is still evaluating their NT technology. Their box is locked out and you have to buy proprietary RAM. They have to build more of a product line and they're committed to doing it.

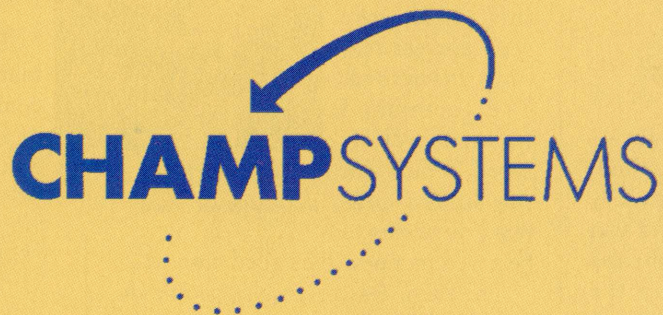
Sun — There's no value for Sun to go to NT. They'd rather be the vendor customers think of for Internet servers.

—K.D.

HP 9000/3000

Want MORE from your HP Remarketer than just a box?

Call US for fast, practical, powerful solutions that won't cost a bundle.



Portland, Oregon
Your Discount HP 9000/3000 Solution.

Call: 800•536•1966
Fax: 503•655•5477
E-Mail: champsystems@msn.com

Find out what ChampSystems can do for you.

Know-it-all In A Shell

HAVE YOU EVER HAD THE MISFORTUNE of spending some time in the company of a know-it-all? If so, you'll probably hate the feature of the tcsh we're discussing this month.

The tcsh has a built in spell-correct feature used for fixing what has been typed at the command line. It's rather like holding a conversation with a know-it-all. The bad thing is that sometimes the tcsh is right. For example, if you were to type:

```
srot file
```

the shell responds with:

```
CORRECT>sort file (ylnlela)?
```

In this case the shell was right — the command **sort** was misspelled. The reply choices are as follows: **y** means accept the correction and run the proposed command; **n** means refuse the correction and run the command as typed; **e** means to drop into the command line editor so you can correct the command; and **a** means abort the command.

SO FAR, SO GOOD

So far this seems like a good feature. The problems only arise when a know-it-all is wrong. For example, if you type:

```
sort names > names1
```

in a directory where only the file *names* exists, tcsh will think you mistyped the second argument (it always thinks that arguments are existing files) and will respond with:

```
CORRECT>sort names >
names (ylnlela)?
```

which is certainly *NOT* what you want.

Doing this would cause the file *names* to be destroyed because you cannot re-direct output into the same file you're reading from. So in this case, the spell correct feature was wrong. The command was correct as typed: You want the sorted contents of *names* to be saved in a new file called *names1*.

For these reasons, many people do not like the spell correct feature of the tcsh. Luckily, the authors of tcsh took this into account. Spell correct is turned off by default. To enable it, the variable named *correct* must be set to *cmd* or *all*:

```
set correct=cmd
```

If it's set as shown above, only commands and not arguments will be checked.

PROMPTNESS COUNTS

Most C shell users are aware that the variable *prompt* can be used to customize the shell prompt. The tcsh allows for several special strings in the *prompt* variable. Like the csh, tcsh allows for the *!* sequence which inserts the current command number. In the tcsh, this can also be written as

%h which does not need the backslash escape. Where it differs from the csh is in the following characters:

```
%t  current time
%B  bold
%S  inverse video
%~%  current directory
%M  full hostname
%%  print a %
```

There are many more listed in the man page, but these are the most commonly used. Here's an example of a rather obnoxious but informative tcsh prompt setting:

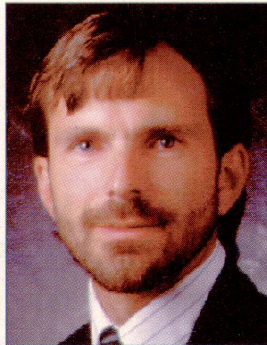
```
set prompt='{ %h } %B %t
%M %b %~ % % % '
```

which might result in a prompt something like:

```
{34}08:36 swift.famece.com
/disc/users/fredm%
```

where the time would keep changing and both the time and the hostname would be in bold text. Note that the *%b* in the prompt string turns off the bold font.

The tcsh has many variables unknown to the csh. Some are used to control functions unique to the tcsh, like *correct*. There are also many variables automatically set by the tcsh, some of which can be quite useful when writing startup files. For example, the variable *HOST* is set to the name of the host and the variable *HOSTTYPE* is set to machine type, using a pre-defined symbolic name



Fred Mallett
frederm@famece.com

like *hp9000s800*. There are many more new variables listed in the *tcsh* man page.

PLAYING THE WILDCARD

To those who know regular expressions, the *cs*h has a limitation in its filename wildcards. The character class wildcard does not permit exclusion ranges. In *tcsh* it does. For example, the wildcard *test[1-3]* means match filenames *test1*, *test2* and *test3*. In *tcsh* you can use a wildcard such as *test[^1-3]* which means match *test* followed by any single character that is not a 1,2, or 3. It would match *test4*, or *testa*, but it would NOT match *test1*. This is very similar to most implementations of regular expressions, as well as the *korn* shell.

Something that the *tcsh* does that I have not seen implemented before in shell wildcards is a “negated match.” If you use a *^* as the first character in a wildcard it means negate the match (note that *^* as the first character in a character class is different, as described above).

Here is an example of a negated wildcard:

```
^test[4-8]
```

This will match all names in the current directory beginning with *test* and ending with 4,5,6,7 or 8 (except names starting with a period). In other words, an *^* as the first character means, “Match everything except what this wildcard matches.” Many people have trouble using this feature because they make the attempt with something like *^test*. This will not work because *^test* is not a wildcard. You can trick the shell by writing something like *^tes[t]* which will match everything but the file named *test*, because it’s now a wildcard.

Here is an illustration:

```
% ls
testa testb testc
% rm ^testa
rm: ^testa non-existent
% rm ^test[a]
% ls
testb testc
```

Many people do not like the spell correct feature of the *tcsh*. Luckily, the authors of *tcsh* took this into account.

I guess the developers of *tcsh* were thinking, “Since we enhanced everything else, we might as well enhance some commands also.” So they did.

For starters, *korn* shell users are used to using *cd* to change back to the previous working directory. You can use that command in *tcsh* also. Another way the *cd* command was enhanced is with the special alias called *cwddcmd*. If you set an alias by that name, it will automatically be called after every *cd* command. For example, if you set it with:

```
alias cwddcmd 'ls -F'
```

every time you change directories, the *ls -F* command will be issued.

XTREME PSEUDONYM

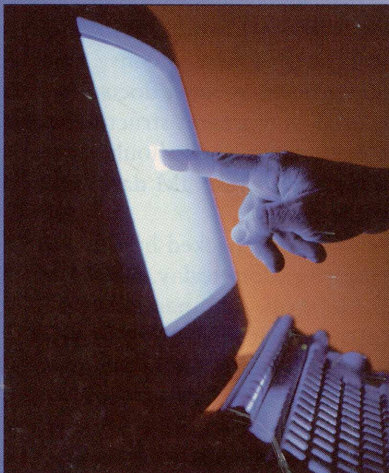
There is an example in the *tcsh* man page that shows how to use this alias to change the *xterm* title to reflect your current directory, except they neglected to mention how to get the escape character into the alias.

The example above is interesting in that if you issue *ls -F* in a *tcsh*, there is

really a built-in version of *ls -F* that is run instead of the usual *ls* command. It’s actually more like *ls -aF*, except that it would be faster since it’s built-in and it also includes more symbols. For example, if a soft link points to a file, it prints an *@* suffix, (like *ls*). If a soft link points to a directory, it uses a *>* suffix on that name. A *&* suffix means the soft link is broken (points to a non-existent name). And there is also an enhanced built in *whereis* command.

To take advantage of the many goodies in the *tcsh*, you need to set several special variables, aliases (like *correct* and *cwddcmd*) and issue *tcsh* only commands (like *bindkey*). If you put them directly in your *cs*h startup file, they might cause errors, or be ignored. The most common method people use is to put *tcsh* special startup commands in the *.tcshrc* file and have that file source as the usual *.cshrc* startup file for the “usual” aliases and variable settings. Another method is to maintain a separate *.cshrc* file for *cs*h, and make your *.tcshrc* startup file self contained for *tcsh*. Remember that if the *tcsh* does not find a *.tcshrc* startup file, it will run the *.cshrc* startup file.

— *There is much more to the tcsh that we have not covered. A good book on the subject is “Using csh & tcsh” by Paul DuBois, published by O’Reilly and Associates, 1995, www.oreilly.com.*

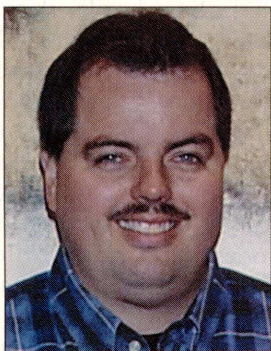


Visit
HP PROFESSIONAL's
Web Site
hppro.com

The ABCs Of WBEM And XML

BMC, CISCO, COMPAQ, INTEL AND MICROSOFT founded the WBEM Forum in 1996. Shortly thereafter, they were joined by HP, IBM and others. As you can imagine,

getting a group like this to agree on standards was nearly impossible. In addition to creating the standards, the group needed them to be widely accepted and used. To that end, about a year ago, the WBEM Forum transitioned to the Distributed Management Task Force (DMTF). Its mission is to unify various management initiatives and provide manageability standards and technologies.



Charles T. Hebert
charles@southernview.com

This would then allow users to develop their own custom managers accessing information collected by an off-the-shelf polling solution written in CIM-compliant systems. On the other hand, software companies, using CIM, could quickly develop manager and agent technology.

Are you with me so far?

SIMPLER DESCRIPTIONS

Another emerging technology that will leverage WBEM is the EXtensible

Markup Language (XML). A subset of the Standardized Generalized Markup Language (SGML), XML is a markup language used for representing structured data in a textual form. One of the main goals of XML is to keep the descriptive power of SGML while removing its complexity. XML is similar to HTML, but whereas HTML is used to convey graphical information *about* a document, XML is used to represent structured data *in* a document. XML should give us the ability to access CIM data easily over the Web.

WBEM is backed by more than 70 major vendors today. Watch for HP, IBM/Tivoli, Compaq and Microsoft to come out with new products this year. Microsoft will be including WBEM in Windows 2000 and in their latest versions of SMS. HP and Computer Associates are actively supporting WBEM in their new management architectures. Unfortunately,

most of these initial tools, though based on standards, will be pretty limited. Time is what these products need. Time will evolve the products, mature and refine the standards and give developers time to catch up with expectations.

Can WBEM help me today? No, but give it a few years.

— Charles Hebert is President of Southernview Technologies, Inc. (Atlanta, Ga.).

REIGNING STANDARDS

One of the first standards under the WBEM umbrella was the Common Information Model or CIM. The DMTF defines CIM as a conceptual information model for describing management that is not bound to a particular implementation. This should allow for the interchange of management information between systems and applications. The communications can be between “agent to manager” and “manager to manager.”

So in a fully CIM-compliant world, it would be possible to build applications using management data from a variety of sources and different management systems, such as HP OpenView, Microsoft Systems Management Server (SMS), Tivoli Management and Compaq Insight Manager. The management data would be collected, stored and analyzed using a common format (CIM).

RELEVANT WEB SITES

WBEM Information From HP

www.hp.com/topools
www.hp.com/desktop/manage
www.hp.com/netserver/products/management

Microsoft's Contribution to WBEM

www.microsoft.com/management/WBEM

Microsoft's Contribution to XML

msdn.microsoft.com/xml

The Web-Based Enterprise Management Forum

www.wbem.net

The Distributed Management Task Force, Inc.

www.dmtf.org

The XML Sponsor's Group

www.xml.com

Attack IT problems before they attack you with the world's most powerful network and systems management tools.

Magnum Technologies, Inc. solves IT problems and provides significant value to its clients through leading edge "Zero Administration" network and system management tools. This includes event management, root cause analysis, capacity & trending, web based reporting and SLA monitoring.

Magnum's Suite of Products

COORDINATOR — Automatically provides root cause analysis of Networks, Systems & Resources.

CAP-TREND — Proactively identifies Network & System capacity issues *before* they become a problem.

ADVANTAGE — Policy-based Service Level Management for Networks, Systems & Resources

ISM (Internet Service Monitoring) — Monitors Internet services by quickly verifying & testing the availability of services like SMTP (e-mail), HTTP (Web), DNS, etc.

NTM (NT Event Monitoring) — Monitors "events" on NT Servers and Workstations *without* the deployment of Agents.

NTP (NT Performance Monitoring) — Collects performance data on NT Servers & Workstations *without* the deployment of Agents.

*For further information or a free product evaluation call us toll free at **1.877.462.4832** or visit our website at **www.magnum-tech.com***

Visit us at booth 342 at HPWorld August 17-19 in San Francisco

Launch a preemptive strike on IT problems!

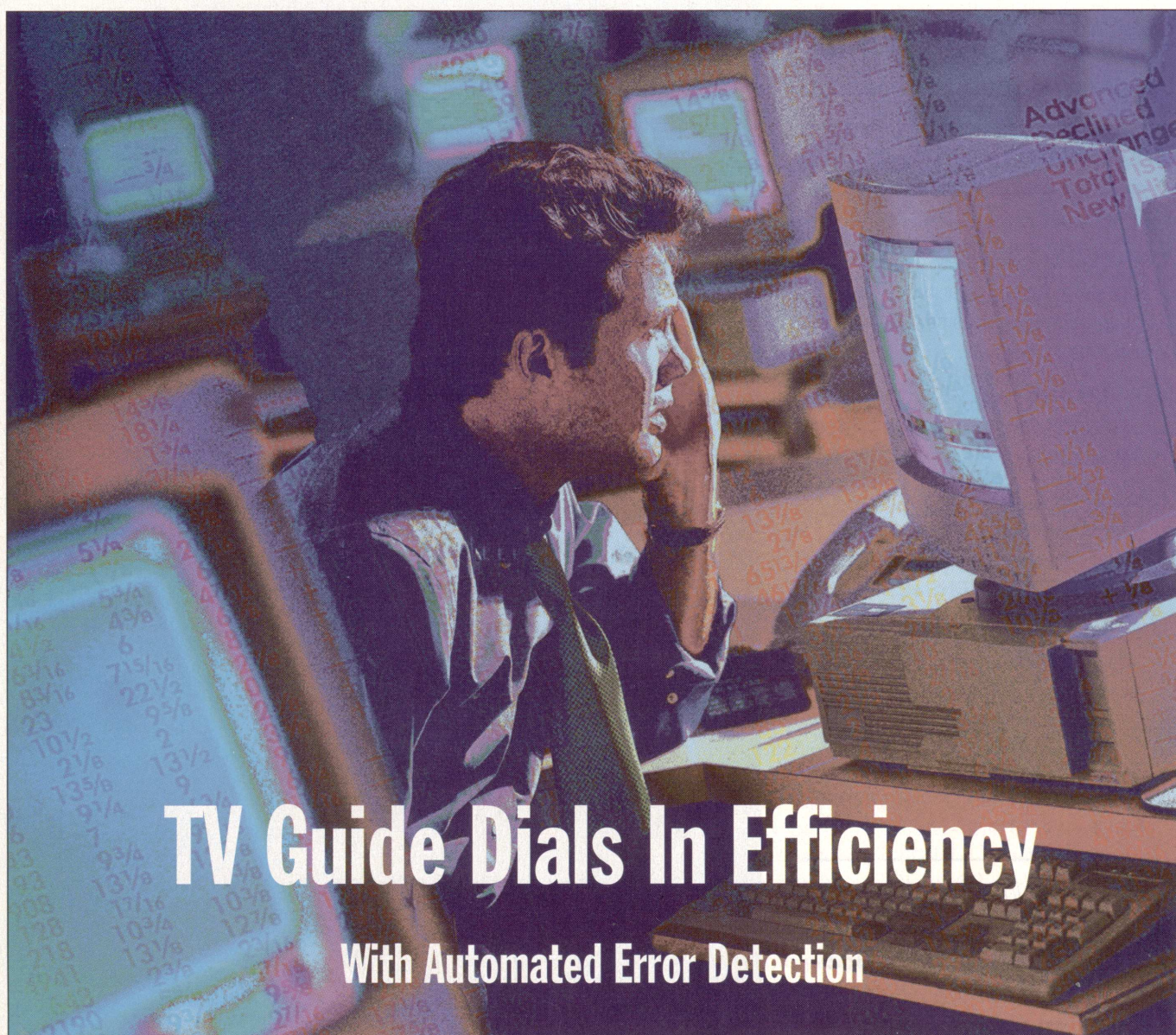


BCI's Reader
Service Link
hpro.com

Tomcat by Dru Blair ©1992

magnum
Technologies

Anyone who manually monitors standard lists (\$STDLIST) on HP3000s to check for errors and abort messages knows how time-consuming it is. Every time a program is run, a \$STDLIST is generated that provides a complete history of that job: how long it ran, the user who ran it, what accounts it ran on, various statistics involved in the process, and most importantly, error or job-abort messages. In a manual operation, each \$STDLIST is printed out and the operators go through them line-by-line to locate the various warning, error and abort notations that signify a problem. When as many as 1,000 jobs per day are run, manual reviews and handling can become a full-time activity for several staff members.

A man in a suit is shown in profile, looking at a computer monitor. The monitor displays a list of data, including fractions and numbers. The background is filled with various mathematical expressions and numbers, creating a sense of complexity and data processing. The overall tone is professional and technical.

TV Guide Dials In Efficiency

With Automated Error Detection

Phil Anthony



Everything was great. Then you got promoted.

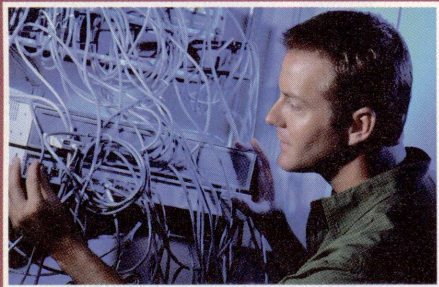
Windows NT is a U.S. registered trademark of Microsoft Corporation. UNIX is a registered trademark of The Open Group in the U.S. and other countries. ©1999 Hewlett-Packard Company

As if your IT workload wasn't heavy enough, suddenly you're also expected to handle revenue issues. Locate new business opportunities. And find new revenue streams. If it hasn't happened already, it will. When e-services transform the Internet, opportunities will explode exponentially. Businesses will scramble for a piece of the action. And servers will make all the difference. Fortunately, you've got **the HP 3000 Business Server**. It has the proven reliability to handle the coming onslaught of information, 24 hours a day. It's compatible with the applications you'll need. And it's easily integrated into an e-services environment with UNIX[®] and Windows NT[®]. What more could you ask for? Oh yeah, a vacation. www.hp.com/go/3000

Propelling the next E. **E-services.**



HEWLETT[®]
PACKARD



While data center staff must always react to notification of error messages, through automation they can respond much more quickly than before. This translates into more time being available for upgrading the overall capabilities of the data center.

Further, because batch processing is normally conducted after close of business, considerable night-shift resources must be invested in manual-

ly monitoring \$STDLISTs. Typically, the machines have a multitude of vital off-hours transactions occurring, including daily, weekly and monthly

reports. It's up to the night-shift operators to make sure these jobs run as planned, reacting to problems and working with on-call resources to resolve them before business resumes in the morning.

During the past ten years, TV Guide, Inc. (Tulsa, Okla.), formerly United Video Satellite Group, has grown from more than 200 to over 1,500 people, placing tremendous demands on the enterprise data center. In the early days, when we only required a few systems and had a low user count, the data center was run by six people, who were dedicated to reviewing job streams and handling error and abort messages manually. To assist with the time-consuming task, we made use of a contributed library utility known as SLEEPER (contributed library programs are

TOOLS FOR PROGRAMMING AND TESTING INTO THE YEAR 2000

Designed specifically for HP MPE and MPE/iX Users

With the Year 2000 deadline quickly approaching, reliable programming tools are essential to help you manage the additional demands placed on the IS Department.

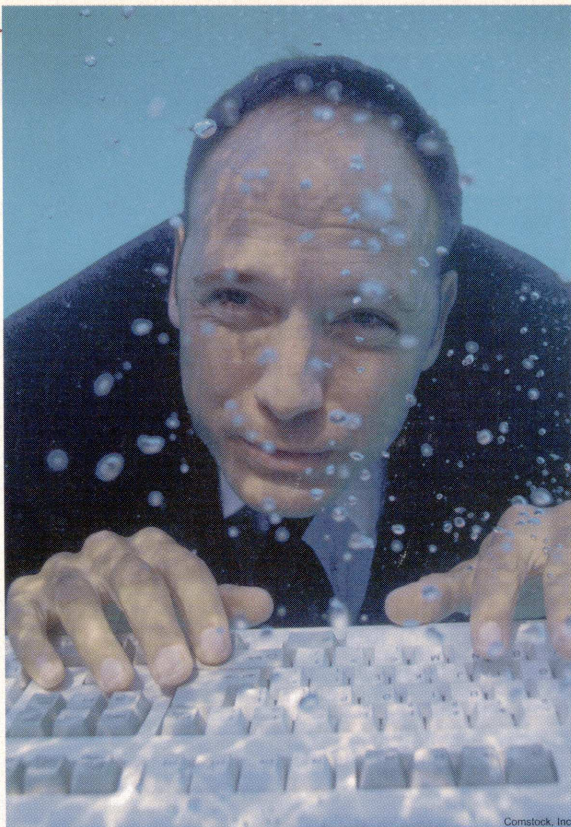
On-going maintenance activities must continue while working on your Year 2000 Project. Harmonizer allows you to effortlessly compare and merge all Year 2000 modifications and other changes to your production version, without impacting your day-to-day programming and development activities.

"Test, test and test again" is the unofficial rule of Year 2000 conversion projects throughout the computer industry. Analyzer allows you to apply strict and systematic testing to your Year 2000 modifications.

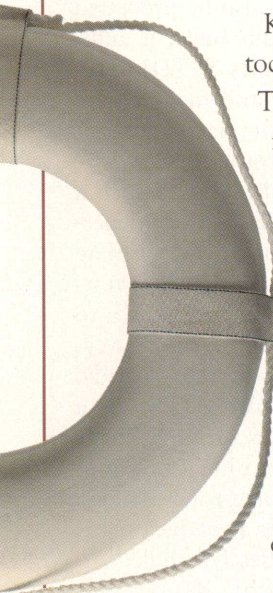


Aldon Computer Group
510.839.3535 • 800.825.5858
Fax: 510.839.2894 • Email: info@aldon.com

Visit our website @ www.aldon.com/hp



Got a sinking feeling about your accounting system?



Keeping your head above water isn't easy in today's constantly changing business world. That's why you need the most **robust, reliable** financial solution you can find - FMS II.

FMS II is overflowing with **flexible features** that go far beyond what you'd find in any other system. You can **customize** screens, menus and toolbars to match individual preferences, and utilize **extensive reporting capabilities** to view and analyze data in virtually any format.

In addition, our automated tools allow each FMS II system to be implemented in as

little as four weeks. And, we'll support you with an **experienced team** of trained CPAs and technical professionals. FMS II is also designed to be **portable** across Windows NT, HP 3000 and Unix environments.

What's more, FMS II's flexible **client/server** architecture, **seamless integration** with other business applications, and **complete year 2000 compliance**, will have you sailing smoothly throughout the next millennium.

So get on board with FMS II today. With a system of this caliber, your financial operation will be more productive, more efficient and more adaptable.

And so will you.

MITCHELL HUMPHREY & Co.

EXCEPTIONAL SOFTWARE FOR EXCEPTIONAL ORGANIZATIONS

BCI's Reader
Service Link
hpro.com

800.237.0028 • Web site: www.mhco-fms.com • E-mail: mhsales@mhco-fms.com





TOTAL SOFTWARE

SOLUTIONS!

Specializing in Manufacturing & Financial Software Since 1980.

CFS Systems provide the tools you need to manage and control your business!

- ◆ Integrated Manufacturing
- ◆ Accounting
- ◆ Job Costing
- ◆ Distribution

Everything in CFS is stable, feature-rich, and easy to use and Y2K compliant.

**Contact CFS today
for a Free
CD-Rom Demo**

Implementation, Installation, Training,
Modifications, Conversion Services & System
Consulting

THE TOTAL SOLUTION

1601 114th Ave SE #153
Bellevue, WA 98004
Phone: 425/453.4776
Fax: 425/453.6473
E-Mail: cfs@cfsinc.com
Web: <http://www.cfsinc.com>

**Visit us at the HPWORLD
Conference in San Francisco
Booth 437**

BCI's Reader
Service Link
hpro.com

HP 3000 SOLUTIONS

written by the HP user community and supplied via tapes to members of the Interex user group). SLEEPER could handle fairly simple scheduling routines, but it had no ability to store and recall job listings. Consequently, the operators devoted many long hours to keeping the job stream flowing.

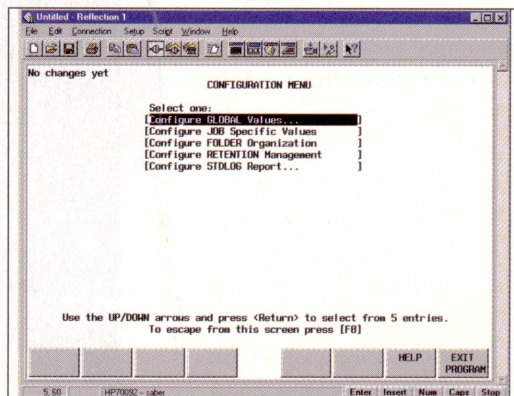
With the rapid expansion of the company, the data center has undergone significant change. Today, 11 HP 3000s operate 24x7. We handle a wide range of jobs, such as call center, back-office, information services, satellite programming, sales reports, customer statistics, corporate sales figures, month-end reporting, cash receipts and weekly reporting. The environment is primarily online and most batch jobs are scheduled for evening processing. Two 969/320s and one 959/300 support our call center back-office system; a 987 and a 978 support our communications link to satellite up-link facilities and six other 9x7s and 9x8s support a variety of other functions, including development efforts. These systems are continuously monitored from a centralized data center staff by shifts of two operators.

Yet, despite the wide array of tasks being performed across the enterprise and the 750% expansion in the number of TV Guide users, the entire data center staff consists of only eight people split into three shifts (which is a 30% increase over the last decade). With so few personnel available, how is it possible to keep up with day-to-day demands?

Several years ago we introduced a software program known as *JobRescue* from Nobix, Inc. (Pleasanton, Calif.) to automate the error and abort message reporting process. *JobRescue* is a HP 3000 job management utility that automatically detects errors, exceptions and abort messages. It eliminates the need for manual review of \$STDLISTs, signifi-

cantly streamlining batch processing operations.

JobRescue is pre-configured to trap job messages and, once running, acts as an unattended batch job, tracking job performance statistics for easy analysis to help data center operations flow more efficiently. As jobs



Manual review of \$STDLISTs generated from thousands of daily jobs is a full-time activity. Nobix's JobRescue acts as an unattended batch job, tracing job statistics for easy analysis.

log off, the program automatically examines each \$STDLIST and multiple \$STDLISTs can also be processed simultaneously. Additionally, it automatically compresses \$STDLISTs, saves them to disk and makes them available online, eliminating fear of lost or misplaced information.

There are many benefits to such a system beyond the reduction of personnel levels, including lower printing and storage costs, return of investment in two to three months and improving data center efficiency. With hundreds of jobs running daily, printing and archiving costs can mount up. Printing is virtually eliminated as operators no longer have to search hard copy for error messages. And with the records available online, archiving is automatically handled.

Additionally, while data center staff must always react to notification of error messages, through automation they can respond much more quickly than before. This translates

SEE THE BIG PICTURE...

YOUR LAN, YOUR WAN, THE WORLD



NightWatch for NT Status - Microsoft Internet Explorer

File Edit View Go Favorites Help

Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit

Address <http://yournightwatchserver> Links

NightWatch for NT

Current Status from **DELL** at 2/2/99 4:20:55 PM

Current State	Waiting	Current Alarms	2	Total Alarms	2
Monitoring Started	2/2/99 4:03:16 PM	Last Scan	2/2/99 4:19:15 PM	Errors	4
Last Alarm Start	2/2/99 4:03:58 PM	Last Page Sent	2/2/99 4:19:43 PM	Page Queue	1
Interval	900	Paging Enabled	True	In Quiet Period	False

Start Monitoring Stop Monitoring Disable Paging Enable Paging Show Activity Log

Browse And See The Status Of All Your Servers... From Anywhere In The World.

NIGHTWATCH NT™
The "Central Console" Piece Of The Nightwatch Enterprise Solution.

NIGHTWATCH
INSTALLS IN 5 MINUTES!
You Can Be Monitoring Important Events In Your Enterprise In Less Than 30 Minutes! CALL AND WE'LL SHOW YOU HOW!

Object Type	Object ID	Last Alarm Start/End	Status
Event Log	Security on DELL	N/A	OK
Event Log	System on DELL	N/A	OK
NT Service	awhost32 on DELL	2/2/99 4:03:58 PM	Please start
NT System	151.198.66.34	N/A	OK
NT System	TECHSERVER	N/A	OK
Ping	1.1.1.1	2/2/99 4:03:58 PM	Fake Serve
Ping	DEC.hillary.com	N/A	OK
Ping	hp3000.hillary.com	N/A	OK
Ping	rs6000.hillary.com	N/A	OK
Syslog	N/A	N/A	OK
Web Page	http://www.hillary.com	N/A	OK
Web Page	https://www.remotesite.com	N/A	OK

NightWatch for NT Version 1.1.7 Released 02-08-98
(c) 1998 Hillary Software, All Rights Reserved
Hillary Software Inc. 309 Morris Avenue Spring Lake, NJ 07762 USA Tel : 800-445-5279, 732-974-848
0167 e-mail: support@hillary.com Web: www.hillary.com

Are my DEC, HP3000 and IBM RS6000 servers up and running? **YES** NO

Is SECURITY OK on the NT Server? **YES** NO

Is the remote INTERNET site up and running? **YES** NO

Is the REMOTE LOGIN enabled for the network? **YES** NO

Are our WEB pages available to our customers? **YES** NO

Get and review a process LOGFILE on the HP9000.
No ERRORS reported? **YES** NO

A process LOGFILE on the HP3000 is searched for error strings. No ERRORS found? **YES** NO

Call Today Or Visit Our Web Site Now For A Demo Copy

Hillary Software, Inc.

309 Morris Avenue, Spring Lake, NJ 07762 USA e-mail:sales@hillary.com
1-800-HILLARY 1-800-445-5279 1-732-974-8484 FAX 1-732-974-0167
Visit our web site www.hillary.com for up to date technical details!

NightWatch for NT Activity Log - Microsoft Internet Explorer

File Edit View Go Favorites Help

Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit

Address <http://yournightwatchserver/log.html> Links

NightWatch for NT

Current Activity Log from **DELL** at 2/2/99 4:32:16 PM

Clear Log Show Status

INFO	2/2/99 4:21:48 PM	Processing of Notification Requests completed...
INFO	2/2/99 4:21:43 PM	Executing page for awhost32 on DELL with C:\Program Files\NightWatch for NT\Alerts\TA
INFO	2/2/99 4:21:43 PM	Processing Notification Requests...
INFO	2/2/99 4:21:06 PM	Status request serviced for 151.198.66.26
INFO	2/2/99 4:20:55 PM	Status request serviced for 151.198.66.35
INFO	2/2/99 4:20:06 PM	Scan complete
INFO	2/2/99 4:20:06 PM	Scanning event log Security on DELL
INFO	2/2/99 4:19:43 PM	Processing of Notification Requests completed...
INFO	2/2/99 4:19:42 PM	Checking https://www.remotesite.com
WARN	2/2/99 4:19:42 PM	NetServerGetInfo failed: (5) Access is denied.
INFO	2/2/99 4:19:39 PM	Checking 151.198.66.34
INFO	2/2/99 4:19:39 PM	Checking TECHSERVER
INFO	2/2/99 4:19:39 PM	Scanning event log System on DELL
ALARM	2/2/99 4:19:38 PM	Please start pcAnywhere
INFO	2/2/99 4:19:38 PM	Checking awhost32 on DELL
INFO	2/2/99 4:19:38 PM	Processing Notification Requests...
ALARM	2/2/99 4:19:38 PM	1.1.1.1 Fake Server is Down
INFO	2/2/99 4:19:36 PM	Pinging 1.1.1.1
INFO	2/2/99 4:19:34 PM	Checking http://www.hillary.com
INFO	2/2/99 4:19:34 PM	Get file (FTP) 151.198.66.2:/home/cpl/tempfile
WARN	2/2/99 4:19:33 PM	(25722) Operation timed out waiting for response from server
INFO	2/2/99 4:19:16 PM	Get file (FTP) 151.198.66.4:/NIGHTWAT/PUB/difzoff
INFO	2/2/99 4:19:16 PM	Pinging hillary.hillary.com
INFO	2/2/99 4:19:15 PM	Pinging hp3000.hillary.com
INFO	2/2/99 4:19:12 PM	Polling Message Server
INFO	2/2/99 4:19:12 PM	Begin a Scan
INFO	2/2/99 4:06:06 PM	Status request serviced for 151.198.66.26

NightWatch for NT Version 1.1.7 Released 12-08-98
(c) 1998 Hillary Software, All Rights Reserved
Hillary Software Inc. 309 Morris Avenue Spring Lake, NJ 07762 USA Tel : 800-445-5279, 732-974-8484 Fax: 732-974-0167 e-mail: support@hillary.com Web: www.hillary.com

BCI's Reader Service Link hpro.com

We're Multiview financial software. Get ready for a *jolt!*

Get ready for the ultimate turn-on.

Experience the **POWER**.

The power to control your software instead of it controlling you.

The *power* to define your accounting structure *the way you want it*.

With Multiview you view your company's performance from the perspective *you* choose: financial, organizational, product line, tax, and more.

Without going through stacks of printed reports. *Without* calling for IS assistance. Just point and click to drill down and around.

Going to HP World? Stop by our booth and enter to win our Grand Prize

THAT'S POWER!

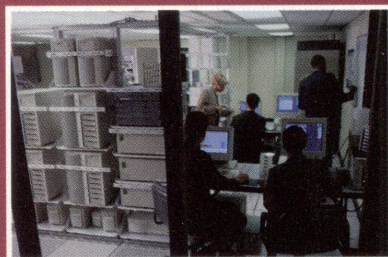
Call us at 1-800-422-0122 or log on to our website at www.multiviewcorp.com for a free on-line demo.

You're sure to find the experience *illuminating*.

Multiview[®]
financial software

BCI's Reader
Service Link[®]
hpro.com

HP 3000 SOLUTIONS



When as many as **1,000 jobs per day** are run, manual reviews and handling of \$STDLISTs can become a full-time activity for several staff members.

into more time being available for upgrading the overall capabilities of the data center. Operators are now able to invest time into productive tasks such as tape management and reporting as well as event logging and notification. For TV Guide, though, the primary benefit of *JobRescue* is quality control. System management and IS staff are free to enter the system at a high-level to quickly locate the reasons why a program failed. This way, we are able to isolate the exact problem in a job stream in a timely manner and are more proactive in accomplishing our IT goals.

The globalization of the business world has made competition fiercer than ever, making every increase in efficiency count. Those who are still printing out \$STDLISTs and checking errors/aborts manually, are absorbing time and money that could be better spent in assuring the future survival of the organization.

— Phil Anthony is director, System Resources at TV Guide, Inc., a global diversified media and communications company that markets and distributes to over 100 million cable and satellite homes in the United States every week.

Don't get caught unprepared!



*Put comprehensive job management and
efficient fault tolerant planning to work for you.*

In the data center, getting caught unprepared can prove very costly. You don't want jobs screeching to a halt or undetected errors slipping by. Prepare your operation for peak performance with Y2K-compliant JobRescue for single and networked HP3000s.

Nobix's JobRescue automates error checking, provides error or condition notification, and can stream jobs based on dependent variables from a local or remote location.

JobRescue goes beyond error detection. It can be configured to help you run your data center more effectively. And JobRescue complements Nobix's

job scheduler and online report viewing products to provide you with an integrated suite of highly efficient management tools.

Let us put comprehensive job management to work for you with a free, fully working license for a limited time. Call today for your copy... and be prepared!

nobix[™]

BCI's Reader
Service Link
hpro.com

6602 Owens Drive
Suite One Hundred
Pleasanton, CA 94588
925.227.5600 phone
925.225.1420 fax
800.538.3818 toll free
<http://www.nobix.com>

JobRescue and Nobix are trademarks of Nobix, Inc.

For complete vendor contact information

**BCI's Reader
Service Linksm
hppro.com**

APPLICATION DEVELOPMENT

JDBC 2.0/Embedded SQLJ

The Informix JDBC 2.0 Driver is a Java (type 4) technology-based implementation of Sun's JDBC 2.0 specification. It enables Java applications to access the Informix Dynamic Server with Universal Data Option. Informix Embedded SQLJ allows application developers to embed SQL statements directly in Java technology-based programs. In addition to the data types defined in the JDBC 2.0 specification, Informix has added support for its Opaque types, which enables customers to define their own custom data types according to their individual business needs.

Contact Informix Corp., Menlo Park, CA at (650) 926-6300.

Report Interface Designer

Report Interface Designer 2.0 is a component-based Windows development utility that simplifies the use of Seagate Crystal Reports. Refining search criteria is done with Linked SQL Controls, which links multiple controls with a master. The Professional edition includes sort criteria controls using the TSortParam component, which permits multiple sorting levels bound to user-selectable criteria dialog controls. Also in the Professional edition is client-side Parameter Sets that allow users to re-use report criteria with no coding. The Standard Edition is \$79, Professional Edition is \$295, and Enterprise Edition starts at \$2,475 for a 25-user single-server license.

Contact TRI-I Engineering, Inc., Cheyenne, WY at (888) 551-3500.

Adonix X3 ERP

Designed for middle market companies, Adonix X3 ERP system includes modules for sales order management; purchasing and inventory control; warehousing and quality control; manufacturing planning and execution and finance, budgeting and analytical accounting. It handles multinational transactions, including finance, taxation, import/export, languages and currencies

and accommodates different distribution and manufacturing processes at multiple locations. Adonix X3 runs on Windows NT and UNIX with Oracle and SQL Server databases. Users interact with the system through Windows NT, Windows 95/98 and Internet Browser software with standard GUI.

Contact Adonix, Pittsburgh, PA at (412) 963-6770.

DESKTOPS AND SERVERS

Winterm 5355SE

The browser-based Wyse Winterm 5355SE thin client is powered by the 200MHz MediaGX processor from National Semiconductor, features the Wyse Navigation browser and is standard with 15 terminal emulations. It features plug-and-play functionality with most popular network management tools, local booting standard and a multi-windowing, multi-sessioning user interface.

It includes 10/100BaseT Ethernet, TCP/IP, PPP and DHCP networking, two serial, one parallel and two USB ports, 32-bit Cardbus, keyboard, mouse and support for standard monitors from nine to 21 inches and above. Retail price is expected to be \$839.

Contact Wyse Technology, San Jose, CA at (800) GET-WYSE.

Telesto3

The PREMIO Telesto3 is a network ready PC featuring a compact case and highly integrated system with the 400MHz Intel Celeron processor with 128K cache, bundled with a 15" digital LCD panel (14.1" viewable) and a DFP port or Digital Flat Panel port. Standard features include 64 MB SDRAM, 6.4GB hard drive, 40X mobile CD-ROM drive (DVD accessible) and onboard Intel 10/100base-T/TX LAN. The Telesto3 includes onboard Creative Labs PCI sound and ATI RAGE XL 4MB SGRAM video. It sells for \$1,619.

Contact Premio Computer, City of Industry, CA at (800) 677-6477.

DISASTER RECOVERY AND SECURITY

F-Secure Workstation Suite 4.0

F-Secure Workstation integrates F-Secure products Anti-Virus, VPN+ and FileCrypto to provide anti-virus and encryption technology in one product. It is a software-only product that requires no input at the actual workstation and no end-user configuration. It supports stan-

dard SNMP network management, integrates with Microsoft Systems Management Server and includes optional support for enterprise management products. It ships with F-Secure Administrator, a Java-based graphical console for managing security policies. Encryption is done at the IP level using a key length of 128 bits. It supports RSA, 3DES and Blowfish algorithms. Pricing starts at \$99 per seat for a 100-user license.

Contact Data Fellows, San Jose, CA at (408) 938-6700.

NETWORK INTEGRATION

LANSTREAM2000/ JETSTREAM4000

The LANSTREAM2000 combines terminal/remote access server capability, integrated hub functionality and Ethernet LAN connectivity in a single turnkey platform. It's available in 16 serial and eight Hub port or eight serial and 16 Hub port versions. The JETSTREAM4000 is an eight port terminal/access server. It offers a built-in parallel port for printer connection and can also provide IP-based dial-access to LAN resources via serial-attached modems. Both come with software for remote management and configuration across the Internet. The LANSTREAM2000 starts at \$1,695 for the 16 serial and eight hub port version, JETSTREAM4000 starts at \$1,095.

Contact Perle Specialix, Campbell, CA at (408) 378-7919.

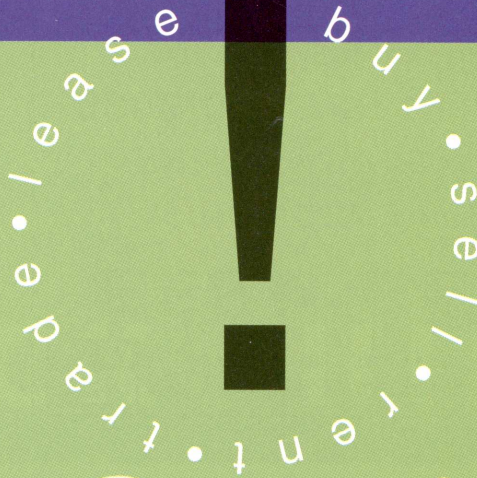
STORAGE

VERITAS Certification

The VERITAS Storage Certification Suite (SCS) provides storage vendors and integrators with the ability to self-certify storage for use with the VERITAS Cluster Server. It's available for use by VERITAS storage hardware OEMs, partners and resellers and offers them the opportunity to familiarize themselves with the VERITAS Cluster Server. It provides the Foundation Suite/HA, which includes VERITAS Volume Manager, VERITAS File System and VERITAS Cluster Server, technical training and a productized version of the VERITAS SCS test suite for storage subsystem qualification. The program is available to qualified storage vendors upon request from VERITAS Software.

Contact VERITAS Software, Mountain View, CA at (650) 335-8000. ♦

We've Got It!



The Specialist

HP-9000 • 3000 • NT
RS 6000 • COMPAQ • SUN MICROSYSTEMS

Have a computer need or problem?
We've got the **Solution** for you!

We Design, Sell, Implement, Install and Support.

Call **1-800-842-8324**

We have the expertise and quality equipment you need!

WE DEAL IN NEW AND RECERTIFIED EQUIPMENT

Reliable Inventory • Quality Standards

We've Got It!



End-User & Broker Calls Welcome
210-227-7726 • 210-227-6223 Fax
website: www.800viatech.com
e-mail: info@800viatech.com

We accept VISA, MasterCard and Purchase Orders

BCI's Reader
Service Link
hpro.com

VIA TECHNOLOGY • 603 Navarro • Suite 800 • San Antonio, Texas 78205

HP9000/3000 & NETSERVERS

Systems & Peripherals

You Paid What For New HP Equipment?

Save 40-80% by purchasing reliable, refurbished Hewlett Packard Equipment. Our equipment is warranted & eligible for HP maintenance.

Business Servers • Netserver • Workstations • Memory
System Upgrades • Printers • Disk Drives • Monitors
Printer Upgrades • Plotters • Hubs • Muxes

For Products & Services You Need... When You Need Them.
Quality, Integrity & Reliability Since 1989

Allon Computer, Inc.
15 Merwin Street
Norwalk, CT 06850



Sales: 800-688-5554
Info: 203-854-9446
Fax: 203-854-6612

ALLON

800-688-5554

www.alloncomputer.com

HP Professional

INTERACTIVE ADVERTISER'S INDEX

Point Your Web browser to www.hppro.com and click on BCI's Reader Service Link for detailed product information on these companies:

ADVERTISER	PAGE #
Aldon Computer Group	38
Bloomfield Computer Systems	17
Bradmark Technologies	15
CFS	40
ChampSystems	31
Comdisco	C4
DIS Research	9
Forsythe Solutions	C3
Hewlett Packard	C2,6,7,21,29,37
HiComp America	3
Hillary Software	41
Hummingbird Communications	11
Infoworld Enterprise Solutions	23
Inotech	4
Magnum Technologies	35
M B Foster, Associates	25
Melillo Consulting	13
Mitchell Humphrey	39
Multiview	42
NHCSI	19
Nobix Inc.	43
TSA	2

ADVERTISING SALES OFFICES (215) 643-8000 FAX (215) 643-8099

MIDWEST/EAST

(215) 643-8063

Gloria Goodwin, National Sales Manager
1300 Virginia Drive, Suite 400
Fort Washington, PA 19034
FAX (215) 643-3901
goodwingm@boucher1.com

WEST COAST

(714) 628-0757

Carolyn Aliotta, Regional Sales Manager
7229 E. Clydesdale Avenue
Orange, CA 92869
FAX (714) 628-0758
aliottacx@boucher1.com

EUROPE

(410) 897-0297

Fran Grega, European Sales Manager
523 Samuel Chase Way
Annapolis, MD 21401
FAX (410) 897-0298
frangrega@compuserve.com

List Rental Manager

(215) 643-8047

Cathy Dodies
dodiescl@boucher1.com

Marketplace Sales Manager

(972) 664-6564

Mary Thomas
FAX (972) 669-9909
thomasmb@boucher1.com

MARKETPLACE

Allon Computer	47
Black River Computers	46
Genisys Corp.	46
I/O Data Systems Inc.	46
Lynne Company	46
Monterey Bay Communications	46
Surety Systems	46
Ted Dasher & Assoc.	46
VIA Tech	45

*The publisher does not assume any liability for errors and omissions.

DATA WAREHOUSING

Power Upgrade

The HP OpenWarehouse Power Upgrade Program comprises several components to help customers tackle data-warehousing technology issues.

Power Upgrade Assessment Service — a free service that includes the evaluation of business needs and technical requirements for warehousing, assessment of current and underlying business and technology issues, projection of capacity and performance and recommendations of technology solutions.

ROI study — a customized return on investment (ROI) analysis service.

Power Upgrade Implementation Services — provides planning and implementation of the technology and architecture upgrades as detailed by the assessment service. HP Consulting or Sysix Technologies (Chicago, Ill.) will manage all phases.

[url: www.hp.com/go/businessintelligence](http://www.hp.com/go/businessintelligence)

NETWORK INTEGRATION

Fibre Channel Products

The HP HHBA-5121A is a 32- and 64-bit, 66MHz PCI Fibre Channel host-adapter that can achieve a PCI bus bandwidth of up to 528MB/s. The HHBA-5121A's High Speed Serial Data Connector (HSSDC) is used to connect to Fibre Channel devices inside the server or workstation cabinet and the Gigabaud Interface Connector (GBIC) is used to connect to external devices, forming a single Fibre Channel arbitrated loop.

The HP HPFC-5166 Tachyon TS Fibre Channel controller IC is a single-chip PCI Fibre Channel controller, optimized to deliver Fibre Channel connectivity to storage subsystems, storage routers, host adapters and host computer motherboards. It is designed for 32- and 64-bit, 66MHz PCI systems, and it is backward compatible with 32- and 64-bit, 33MHz PCI systems.

[url: www.hp.com/go/fibrechannel](http://www.hp.com/go/fibrechannel)

ProCurve Switch 408

With eight 10/100Base-TX auto-sensing ports, the HP ProCurve Switch 408 automatically connects each port at either Ethernet or Fast Ethernet speed. The half- and full-duplex capability doubles the throughput — up to 200Mbps — to each device. Also, the HP ProCurve Switch 408 includes IEEE 802.3x Flow Control, ensuring reliable communication during full-duplex operation. The HP ProCurve Switch 408 is unmanaged and requires no configuration. It sells for \$399.

[url: www.hp.com/go/procurve](http://www.hp.com/go/procurve)

NETWORK MANAGEMENT

TopTools for Hubs & Switches

HP TopTools for Hubs & Switches enables administrators to configure Quality of Service (QoS) features for HP Procurve Switches 8000M, 4000M, 1600M and 2424M. Administrators can reconfigure into a policy-based configuration and bypass the usual means of manually reconfiguring each switch. HP TopTools for Hubs & Switches comes free with all managed HP ProCurve hubs and switches.

[url: www.hp.com/cgi-bin/toptools/index.cgi](http://www.hp.com/cgi-bin/toptools/index.cgi)

WAN OSS

HP and Cisco Systems have jointly developed a solution for provisioning and managing asynchronous transfer mode (ATM) and Frame Relay circuits. The new solution — a wide area network (WAN) Operations Support System (OSS) offering end-to-end deployment and operations support for WAN services — is targeted to help service providers reduce costs and increase revenues generated by their ATM and Frame Relay networks.

[url: www.hp.com/ovc](http://www.hp.com/ovc)

PRINTING

JetSend Mobile Printing

JetSend Mobile Printing Solution is a no-cost downloadable utility that enables handheld PCs running Windows CE to send print jobs to any JetSend/IR-enabled printer without drivers, producing print jobs up to 10 times faster than conventional methods. Print jobs are transmitted wirelessly via infrared technology. When both the printer and the handheld PC have JetSend installed, they can exchange information.

[url: www.jetsend.hp.com](http://www.jetsend.hp.com)

LaserJet 4050

The HP LaserJet 4050 prints at speeds of up to 17 ppm at 1,200 dpi. Networked with a 10/100 BaseTX HP JetDirect 600N EIO print server, it integrates into all Ethernet environments. It contains a 133MHz RISC processor, 8MB of memory in the base model and 16MB in the network model. Features include kiosk printing, a mail-folding feature and envelope feeder and walkup wireless printing for mobile users.

Estimated prices are: LaserJet 4050, \$1,099; LaserJet 4050T \$1,249; LaserJet 4050N \$1,415; LaserJet 4050TN \$1,599; LaserJet 4050se, \$1,149.

STORAGE

DVD+RW Drives

HP's new HP DVD Writer 3100i drive reads and writes to DVD+RW discs, which have 3.0GB of storage capacity. The HP DVD Writer 3100i can also read DVD-ROM, DVD movie, CD-RW, CD-Recordable (CD-R), CD-ROM and CD audio. The new drive uses disc media, similar to a CDs. At approximately \$30 per DVD+RW disc, the cost per MB is less than a penny. The expected price is \$699.

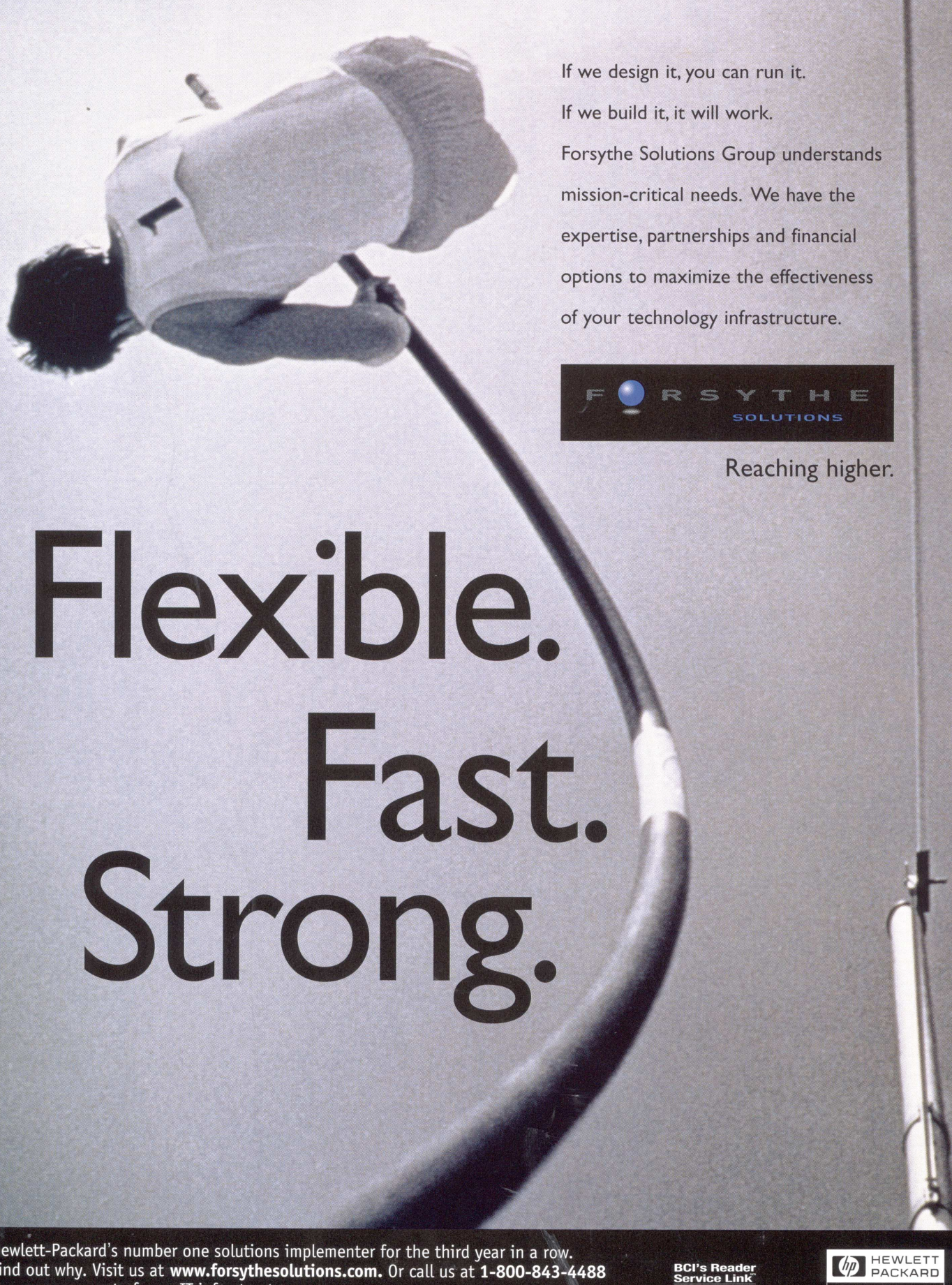
WORKSTATIONS

Visualize Workstations

The B1000 is an entry-level graphics workstation for 2-D or 3-D designs for \$9,888. The C3000 speeds virtual prototyping and integrated circuit design for \$13,763. And the J5000 is a dual-processor deskside graphics workstation for compute-intensive workloads for \$22,636. Each runs the PA-8500 RISC processor.

The NT-based P550 Personal Workstation with HP VISUALIZE fx4+ graphics, a Pentium III Xeon 500MHz processor and Wildcat 4000 3-D graphics starts at \$3,375

[url: www.hp.com/go/visualize](http://www.hp.com/go/visualize)



If we design it, you can run it.

If we build it, it will work.

Forsythe Solutions Group understands mission-critical needs. We have the expertise, partnerships and financial options to maximize the effectiveness of your technology infrastructure.



Reaching higher.

Flexible. Fast. Strong.

Hewlett-Packard's number one solutions implementer for the third year in a row. Find out why. Visit us at www.forsythesolutions.com. Or call us at 1-800-843-4488 for an assessment of your IT infrastructure.

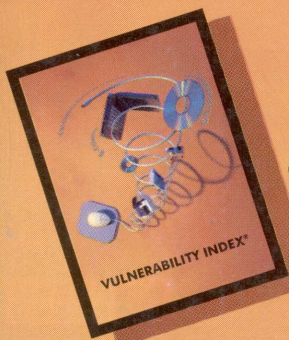
BCI's Reader
Service Link
hpro.com



OUT HERE ON THE SERVER FARM,
WE'VE GOT NO TIME FOR A DISASTER.



In the event of a disaster, remember. You can survive three weeks without food, three days without water. And three minutes without your computers. Run SAP®, Peoplesoft®, or Oracle® and the challenges get a little bit tougher. We know because we run the same enterprise applications you do. And we have 19 years of experience, with more recoveries than anyone else. So no matter how complex your client-server environment gets, at Comdisco you'll feel right at home.



Calculate your company's vulnerability.
Call 1-800-272-9792 or visit us at www.comdisco.com
for your free copy of the Comdisco Vulnerability Index®.

Vulnerability Index® is a registered trademark of Comdisco. All other trademarks are the property of their respective companies. © 1999, Comdisco

COMDISCO®

MANAGING TECHNOLOGY IN THE FACE OF CHANGE

BCI's Reader
Service Link
hpro.com